EXPANDED PROJECT NOTIFICATION FORM

1252-1270 Boylston

Boston, Massachusetts

PROPONENT:

Scape Boylston, LLC

IN ASSOCIATION WITH:

Gensler
AB Rogers Design
Copley Wolff Design Group

SUBMITTED TO:

Boston Planning & Development Agency

PREPARED BY:

vhb

SUBMISSION DATE:

April 2019

April 11, 2019

BY HAND DELIVERY

Mr. Brian P. Golden, Director
Boston Planning & Development Agency
Boston City Hall, Ninth Floor
Boston, MA 02201

c/o: Mr. Tim Czerwienski, Project Manager

RE: Expanded Project Notification Form | Large Project Review | 1252-1270 Boylston

Dear Director Golden:

Scape Boylston, LLC (the "Proponent") – an affiliate of Scape – is pleased to respectfully submit this Expanded Project Notification Form (the "EPNF") initiating Large Project Review under Article 80B of the Boston Zoning Code for the redevelopment of 1252-1268 Boylston Street and 1270 Boylston Street (collectively, the "Project" or "1252-1270 Boylston") in the Fenway neighborhood.

The Project will consist of approx. 235,095 square feet of mixed-use programming, comprised of 533 professionally-managed academic accommodations and an activated, permeable, ground-floor retail podium designed for a broad range of neighborhood-oriented culinary, lifestyle and experiential tenants.

The Project will also include the Boylston Black Box, an LGBTQ-centric venue for the performing arts – anchored by a 120-seat theater – which will be delivered and operated on a not-for-profit basis.

The Project will serve as a beacon of innovation in the U.S. private academic accommodations sector, paralleling the model that Scape has pioneered and proven over the past decade in the U.K., Ireland and Australia. At each of its locations, Scape focuses on the power of placemaking and endeavors to deliver an integrated onsite ecosystem which allows its academic residents – graduate and undergraduate – to participate in a positive way in the neighborhoods in which they live.

Scape selected Boston, the epicenter of U.S. education, as its North American headquarters because the City embodies the Scape philosophy – that the academic population should be part of the fabric and culture of a city. Scape firmly believes that the presence of proper, thoughtfully-programmed, 'purpose-built' academic accommodations can be accretive to an urban neighborhood and can also foster derivative impacts favorable to its residents, including the recapture of housing inventory and the creation of new permanent local jobs.

Scape is the long-term owner, holder and operator of its properties – accordingly, Scape embraces an ethos of stewardship and is deeply committed to the success (present *and* future) of the Fenway neighborhood

The Project addresses the acute (and exacerbating) housing challenges in the Fenway neighborhood, where the academic population is exerting enormous pressure on the supply-constrained housing market, displacing the workforce and families and driving-up rental costs. Due to the major disparity in the neighborhood's housing stock – a spectrum presently characterized by, (i) aging product that has reached the end of its useful life on one end, and, (ii) luxury condominiums on the other end – the academic population, the workforce and families are all competing for the limited amount of 'middle-market' neighborhood housing.

The Project will have a direct, positive impact on the current 'supply & demand' imbalance in the Fenway neighborhood, alleviating stress on the 'middle-market' segment of housing spectrum. Through the combination of meaningful scale, prudent programming, intelligent design and operational acumen, the Project will generate the magnetism required to draw a portion of the academic population out of the existing neighborhood housing stock and into Scape's 'purpose-built' product, thereby returning those existing units to the workforce and families, and dampening demand-driven rent increases.

Importantly, the Project will be 'purpose-built' for academic residents – graduate and undergraduate – of the twenty-first century. The full-service building will be operated – 24 hours per day, seven days per week – by full-time, extensively-trained, professional Scape employees. The newly constructed building will adhere to – and continue to comply with, at all times – the most current life-safety systems requirements and unit-occupancy limits.

The comprehensive Scape staff – many of whom will hopefully be recruited from the Fenway neighborhood – will operate the building with a steadfast focus on the health and wellness of its residents. Furthermore, the onsite staff will exemplify Scape's unwavering commitment to community citizenship, neighborhood engagement and consistent communication.

Scape perceives the need for graduate academic accommodations in the Fenway neighborhood as particularly severe – and often overlooked – and, therefore, the Project will include environments to serve the graduate-level scholars driving the City's research and intellectual exploration.

Scape is excited to help the City achieve its critical housing objectives, which include the need for 69,000 units of housing, 16,000 new undergraduate beds and 3,000 new graduate beds by 2030. Throughout the past decade – as Scape has developed and operated its global portfolio of over 10,000 units – Scape has worked closely with various public and private parties in London, Dublin, Sydney, Melbourne and Brisbane to tackle many of the same urban challenges present in Boston and the Fenway neighborhood (e.g. displacement, fragmented and deteriorating housing stock, the need for 'purpose-built' academic accommodations). While each city is certainly unique, Scape is eager to draw upon the breadth and depth of its global experience – and its Boston-based expertise – to engender a collaborative, solution-oriented partnership with the City, the neighborhood and all stakeholders.

With regards to design, Scape seeks to deliver enduring – and appropriate – architecture at each of its global locations. The contextual design of the Project respects the commercial urban fabric delivered along the Boylston Street corridor in recent years, while also expressing the neighborhood's architectural heritage through a distinct masonry façade. The Project also consists of landscape and streetscape improvements to cultivate pedestrian activity and enhance the public realm, which is currently inhibited by the deficient existing onsite conditions. The Project is subject to Large Project Review under Article 80B of the Boston Zoning Code and the Proponent will seek dimensional and use variances from the Board of Appeal.

The Proponent is committed to delivering a mixed-use program that serves the long-term interests of the Fenway neighborhood. The Proponent has proactively engaged with various neighborhood stakeholders over the past 18 months and looks forward to continuing to work closely with all parties in connection with the Project, including you and your staff, other City agencies, the Impact Advisory Group and the broader community. We anticipate public notice of receipt of this EPNF will be published within five days, as required by Section 80A-2(3). Requests for copies of this EPNF should be directed to Sarah Black at (617) 607-6120 or via email at sblack@vhb.com.

Sincerely,

Nigel Taee
Founder and Executive Chairman
Scape North America

Andrew Flynn
Founder and Chief Executive Officer
Scape North America

cc: Mr. Jonathan Greeley, Director of Development Review, Boston Planning & Development Agency
Mr. Tim Czerwienski, Project Manager, Boston Planning & Development Agency
Mr. John Barros, Chief of Economic Development
Ms. Sheila Dillon, Chief of Housing and Director of Neighborhood Development
Ms. Yissel Guerrero, Mayor's Office of Neighborhood Services
Boston City Councilor Josh Zakim
State Senator William Brownsberger

1252-1270 Boylston

Boston, Massachusetts
April 2019

SUBMITTED TO:	**Boston Planning & Development Agency** One City Hall Square, 9th Floor Boston, MA 02201	
PROPONENT:	**Scape Boylston, LLC** 22 Boston Wharf Road, 7th Floor Boston, MA 02210	
PREPARED BY:	**VHB** 99 High Street, 10th Floor Boston, MA 02110	
IN ASSOCIATION WITH:	Gensler Ab Rogers Design Copley Wolff Design Group Sullivan and Worcester LLP McNamara Salvia	Code Red Associates WSP McPhail Associates InkHouse StudioTyak

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1

Project Overview

In accordance with Article 80B of the Boston Zoning Code (the "Code"), Scape Boylston, LLC (the "Proponent") respectfully submits this Expanded Project Notification Form (the "EPNF") to the Boston Planning & Development Agency (the "BPDA") to initiate Large Project Review for the redevelopment of 1252-1268 Boylston Street and 1270 Boylston Street (collectively, the "Project" or "1252-1270 Boylston"), in the Fenway neighborhood of the City of Boston (the "City").

The Project consists of approx. 235,095 square feet of mixed-use programming, comprised of 533 academic accommodations and an activated ground-floor retail podium fronting on Boylston Street.

The Project also includes the Boylston Black Box, an LGBTQ-centric venue for the performing arts – anchored by a 120-seat theater – which will be delivered and operated on a not-for-profit basis.

The Proponent has proactively engaged with various neighborhood stakeholders to solicit feedback and has thoughtfully designed the Project to generate sustained benefits – tangible and intangible – for the broader Fenway community.

As a long-term owner and operator, the Proponent is committed to cultivating alignment – present and future – with all neighborhood stakeholders.

This chapter provides an overview of existing conditions and describes the key elements of the Project.

1.1 Site Context and Existing Conditions

The Project will be located on an assemblage of two adjacent parcels – 1252-1268 Boylston Street and 1270 Boylston Street (collectively, the "Project Site") – consisting of approx. 33,585 square feet of land, located south of Boylston Street and north of Private Alley 937. Refer to Figures 1.1 – 1.3, which pertain to the geographic location of the Project Site; Figures 1.4a – 1.4h present photographs of the Project Site.

The 1252-1268 Boylston Street parcel currently consists of a two-story rectangular building which was constructed in 1923. Portions of the existing building are presently leased to academic and retail tenants, however, a significant portion of building is presently vacant, as the existing conditions are a challenging constraint for many contemporary retail tenants. This has resulted in a general lack of activation at the Project Site.

The 1270 Boylston Street parcel consists of a two-story rectangular building which was constructed in 1919. The existing building – including its open-air rooftop terrace – is currently occupied by a retail tenant, specifically a food and beverage operator.

The Project Site has vehicular access from the north via one existing curb-cut on Boylston Street and from the south via Private Alley 937.

Currently, commercial loading, unloading, and servicing of the Project Site takes place along both Boylston Street and Private Alley 937.

The grade of the Project Site is level (in all material respects) from west to east along Boylston Street. The grade of the Project Site changes by approx. seven feet from north to south, decreasing between Boylston Street and Private Alley 937.

1.2 Project Description

The Project consists of approx. 235,095 square feet of mixed-use programming, comprised of 533 professionally-managed academic accommodations and an activated, permeable, ground-floor retail podium designed for a broad range of neighborhood-oriented culinary, lifestyle, and experiential tenants.

The Boylston Black Box – a not-for-profit arts and cultural performance venue – consists of a main entrance fronting on Boylston Street and includes a 120-seat theater, 'flex' space and support functions. The Boylston Black Box is further detailed herein and in Appendix A.

Back-of-house space, storage, and parking are located below grade.

The Project will replace the decaying, non-descript existing structures – which have exhausted and exceeded their useful lives and inhibit the public realm – to construct an architecturally-compelling, contextual building which combines elements of the neighborhood's design heritage with contemporary components.

The Project includes various public realm improvements – pertaining to streetscaping, hardscaping, landscaping, lighting, waste management, seating, access, and bicycling – which foster activation, increase utilization, and enhance safety for all neighborhood stakeholders, particularly pedestrians and bicyclists.

Additionally, the Project addresses and alleviates – on a meaningful scale – the acute academic housing challenges experienced in the neighborhood, in which an immense off-campus population of graduates and undergraduates is exerting enormous pressure on the supply-constrained housing market, displacing the local workforce and families, and driving-up rental costs.

1.2.1 Proposed Development Program

The proposed development program for the Project is summarized below in Table 1-1; supplemental detail follows thereafter.

Table 1-1 Proposed Development Program

Project Element:	Approximate Dimension:	Quantity:
Academic Accommodations:	190,000 GFA	533 units
Retail:	16,325 GFA	--
Supplemental and Support Spaces:	28,770 GFA	--
Project Total:	**235,095 GFA**	**533 units**
Parking:	--	15 spaces
Project Site Land Area:	33,585 square feet (0.77 acres)	--
Floor Area Ratio:	7.0	--
Zoning Height:	175 feet	15 stories

Note: All dimensions are approximate; unless otherwise noted, all areas provided herein are in Gross Floor Area (GFA) as such term is defined in the Code; average site grade is 19.4 feet.

The academic accommodations component of the Project will be ‘purpose-built’ for scholastic residents – graduate and undergraduate – of the twenty-first century.

The Proponent – an affiliate of Scape, which operates over 13,000 units across the United Kingdom, Ireland, and Australia – will draw upon its depth and breadth of experience and operational acumen.

The full-service building will be operated – 24 hours per day, seven days per week – by full-time, extensively-trained, professionals employed directly by the Proponent.

The comprehensive staff will operate the building with a consistent focus on coordination and cooperation with neighborhood stakeholders, integration and communication with academic institutions, and safety and security of its staff and its residents.

The newly constructed building will adhere to – and continue to comply with, at all times – the most current life-safety systems requirements and unit-occupancy limits. Leases will be for terms of 51 weeks and subleasing and overnight rentals (e.g. ‘Airbnb’) will be expressly prohibited. Each resident will be fully documented and rostered and will be subject to compliance with an enforceable rental agreement and a detailed handbook (which the Proponent is prepared to share with the City and the neighborhood for annual review).

The Project's location, scale, service offering, and turn-key, fully-furnished units will effectuate the magnetism needed to draw academic tenants from the existing neighborhood housing stock, returning that inventory to the workforce and families.

The retail component of the Project will be located on the ground floor – fronting on Boylston Street – and will be designed to suit a range of neighborhood-oriented culinary, lifestyle and experiential tenants. The ground floor design incorporates meaningful setbacks in order to create additional space for outdoor dining and public enjoyment.

The Boylston Black Box will be comprised of approx. 6,000 square feet of space. The bona fide arts and cultural performance venue will consist of a main entrance fronting on Boylston Street and a feature staircase leading to 'double-height' space.

In addition to the 120-seat theater, the Boylston Black Box will also include 'flex' space which will be utilized for various purposes (i.e. suitable for small-group meetings, events and seminars, or alternatively, able to accommodate food & beverage catering to accompany performances). The Boylston Black Box is further detailed herein and in Appendix A.

Landscaping and wide sidewalks will be delivered along Boylston Street, with a line of trees buffering the pedestrian space from the roadway.

The Project will provide secure indoor bicycle storage for building occupants, and the Project will also provide outdoor bicycle racks for public use.

Trash removal will occur along Private Alley 937 (consistent with current onsite practices), however, new infrastructure will facilitate indoor trash storage and management going forward, allowing for the removal of existing onsite dumpsters.

The Project will revitalize a critical node of the Fenway neighborhood, and position it for long-term vibrancy.

1.2.2 Project Schedule

It is anticipated that the Project will commence construction in the fall of 2019, with a duration of approx. 22 months, and completion expected in 2021.

1.3 Consistency with the Fenway Urban Village Plan

The Fenway Urban Village Plan was developed by an independent group in the early 1990s and has been updated several times since then, led by the Fenway Community Development Corporation (the "FCDC"), in consultation with community members through surveys, topic-based working groups, and community workshops.

The Fenway Urban Village Plan was updated in 2015 and identifies five key areas that contribute to an urban village environment:

1. A sufficient and varied housing supply that promotes diversity and equal opportunities.
2. A healthy business community serving local residents and visitors alike, while providing employment opportunities for Fenway residents.
3. Optimization of all methods of transportation to promote universal access.
4. Vibrant public gathering places and arts and cultural activities accessible to all.
5. A transparent agreement between Fenway residents and institutions that guarantees more community input in the development process.

The Project has been designed to align with the Fenway Urban Village Plan's vision:

› The Project expands the housing typology and supply through innovation – by introducing a purpose-built environment, the academic population will be drawn from the neighborhood existing housing stock, thereby returning those units to the workforce and families and dampening demand-driven rent increases.

› The Project will deliver a unique, accessible and enduring neighborhood arts and cultural hub – Boylston Black Box.

› The Project will enhance the public realm surrounding the Project Site through streetscape improvements and ground-floor activation.

› The comprehensive permanent onsite staff – many of whom will hopefully be recruited from the Fenway neighborhood – will exemplify a commitment to community citizenship, neighborhood engagement and consistent communication and transparency.

1.4 Boylston Black Box

As a stakeholder dedicated to the long-term vibrancy and character of the Fenway neighborhood, the Proponent will be delivering the Boylston Black Box as part of the Project.

The Boylston Black Box will be an LGBTQ-centric venue for the performing arts – anchored by a 120-seat theater – which will be delivered and operated on a not-for-profit basis.

Commitment to an LGBTQ Identity

The Boylston Black Box will embrace the long-standing LGBTQ heritage of the Project Site. Since the 1970s, the Project Site has served as the location of various LGBTQ entertainment venues, including 'The 1270', 'Quest', 'RamRod', and 'Machine'. These entertainment venues have been emblematic LGBTQ spaces and have often served – directly and indirectly – as a base for the LGBTQ community in the Fenway neighborhood.

The Boylston Black Box will seek to honor the history of the LGBTQ community's important relationship with the Project Site and with The Fens and will serve as an iconic location for the LGBTQ community going forward.

Alignment with Arts and Cultural Priorities

In conjunction with its commitment to an LGBTQ identity, the Boylston Black Box will also align with the arts and cultural priorities of the City and the Fenway Urban Village Plan.

While the approx. 6,000-square-foot Boylston Black Box will be newly-constructed, purpose-built and technology-enabled, it will also be versatile, flexible, accessible and affordable. The confluence of these critical traits will establish the Boylston Black Box as a premier arts and cultural destination and a hub for innovation and exploration.

The Boylston Black Box will accommodate programming across the spectrum of the performing arts and will address key objectives and challenges identified by the *Boston Creates (2016)* report and the *Boston Performing Arts Facilities Assessment (2018)*.

The Boylston Black Box is further detailed in Appendix A.

1.5 Summary of Public Benefits

Additional public benefits for the Fenway neighborhood and the City are summarized in the following subsections and described in detail in the chapters that follow.

Urban Design and Public Realm

- Replace decaying, non-descript buildings which have exhausted their useful lives with an architecturally compelling, contextual building which combines elements of the neighborhood's heritage with contemporary components.
- Provide a variety of building heights to break up the facade while maintaining a sense of consistency along the block.
- Extend the current urban fabric by implementing masonry and copper inspired materials that will nod to the existing heritage of the Fenway neighborhood.
- Enhance public realm and outdoor space design that follows the recent neighborhood development guidelines to complete the Boylston Street corridor.
- Transform a gateway corner of Boylston Street.
- Create a more vibrant, pedestrian-friendly environment.
- Expand the Boylston Street corridor with a building that is designed for both its neighborhood residents and the public (e.g. ground-floor retail services and outdoor public space).
- Upgraded service and loading area on Private Alley 937.

Socioeconomic

- Supply the Fenway neighborhood with an innovative, purpose-built housing type which will draw academic residents out of the existing housing stock and return units to the workforce and families.
- Reverse the displacement of neighborhood residents by alleviating the demand on the traditional housing stock in the Fenway.
- The academic population has always been – and will continue to be – a major component of the fabric and culture of the Fenway neighborhood. The Proponent firmly believes that the presence of proper, thoughtfully-programmed, purpose-built academic accommodations can be accretive to an urban neighborhood and can also foster derivative impacts favorable to its residents, including the recapture of housing inventory and the creation of new permanent jobs available for – and attainable by – the local workforce.
- Create approx. 310 new construction jobs and approx. 85 new permanent jobs over the course of the Project.
- Increase local and state tax revenues.
- Invest in the long-term trajectory of the community through philanthropic support.

Environment / Sustainability

- Repurpose a previously developed site – which is currently underutilized and stagnant – in a dense urban setting as opposed to building on undeveloped open space.
- Target to exceed minimum certifiable standards by targeting a minimum of LEED Silver certifiable level; the Proponent will also consider implementing WELL Building Standard™("WELL") principals in design and operations.
- Provide for a high level of sustainability by designing the Project Site and buildings using the LEED v4 rating system, in compliance with Article 37.
- Reduce heat island effect by incorporating greenery throughout the Project Site, utilizing reflective roof materials and/or vegetated roofs.
- Consider energy conservation measures, including a cogeneration system for recovery of energy and usage savings.
- Improve existing conditions by complying with all applicable stormwater management standards to the extent practicable to improve water quality; recharge groundwater in accordance with the Groundwater Conservation Overlay District (the "GCOD") requirements, to the maximum extent practicable, and manage stormwater runoff rate, and provide infiltration through below-grade re-charge and the incorporation of pervious surfaces.

Transportation

- Minimize vehicular traffic through design, facilitation and promotion of alternative modes of transportation (e.g. walking, transit, bike-share and car-share programs, etc.).
- Provide for a permeable environment with sidewalk improvements along Boylston Street.
- Provide new sidewalks and ramps that conform with Americans with Disabilities Act and Architectural Access Board (ADA/AAB) standards.
- Implement a comprehensive Transportation Demand Management ("TDM") Plan with specific measures to promote and encourage residents and visitors to use sustainable transportation modes.
- Provide approx. 267 indoor / secure bicycle storage spaces for building occupants as well as public outdoor bicycle racks. In addition, building staff will be instructed to provide in-unit bicycle storage solutions, if requested.
- Reduce the need for large moving trucks by providing efficient, fully-furnished units.

1.6 Regulatory Context

Table 1-2 presents a preliminary list of permits and approvals from governmental agencies that are expected to be required for the Project.

It is possible that only some of these permits or actions will be required, or that additional permits or actions will be required.

Table 1-2 Anticipated Project Permits and Approvals

Agency / Department:	Permit / Approval / Action:
Federal:	
Environmental Protection Agency	Remediation General Permit (if necessary)
	Construction Dewatering General Permit (if required)
Federal Aviation Administration	Determination of Non-Hazard to Air Navigation
Commonwealth of Massachusetts:	
Massachusetts Historic Commission	Determination of No Adverse Impact (if required)
Department of Environmental Protection	Notice of Demolition and Construction
	Installation Compliance Certification (self-certification) – through the Environmental Results Program for heating boilers and emergency generators – (if required)

Agency / Department:	Permit / Approval / Action:
	Notice of Asbestos Removal (if required)
	Remedial Action Measures (“RAM”) (if required)
Department of Public Safety	Building Code Variances (if required)
Massachusetts Water Resource Authority	Temporary Construction Dewatering Permit (if required)
City of Boston:	
Boston Planning & Development Agency	Article 80B, Large Project Review (and execution of related agreements)
	Design Review
	Boston Residents Construction Employment Plan Agreement
Boston Interagency Green Building Committee	Zoning Article 37 Green Building Compliance and Climate Resiliency Checklist Review
Boston Civic Design Commission	Design Review
Boston Zoning Board of Appeal	Use and Dimensional Variances
Boston Landmarks Commission	Article 85 Demolition Delay Review
Boston Transportation Department	Transportation Access Plan Agreement
	Construction Management Plan
Boston Water and Sewer Commission	Site Plan Approval
	Water and Sewer Connection Permit
	Temporary Construction Dewatering Permit
Boston Inspectional Services Department	Demolition Permit
	Building Permit for Construction
	Certificate of Occupancy
Boston Public Works Department	Curb Cut Permit
Public Improvement Commission	Streetscape / Earth Retention Approval (if required)
	Specific Repair Plan
Boston Public Safety Commission, Committee on Licenses	Flammables Storage License
	Permit to Erect and Maintain Parking Garage (if required)
Boston Fire Department	Approval for Fire Safety Equipment

1.6.1 City of Boston Zoning

The Project Site is in the Fenway Neighborhood Zoning District, as shown on Map Q, and governed by Article 66 of the Code. A portion of the Project Site is within the Multifamily Residential Subdistrict ("MFR-2"); a portion of the Project Site is within the South Boylston Neighborhood Shopping Subdistrict ("NS-1"). The Project Site is within the GCOD and the Restricted Parking Overlay District; the portion of the Project Site in MFR-2 is within the Neighborhood Design Overlay District (the "NDOD").

Zoning Compliance

The Project's private academic accommodations component is classified by the Code as a "dormitory not accessory to a use," and will require a variance for the portion located in NS-1 and a conditional use permit for the portion located in MFR-2. The Project's retail component, located in NS-1, is allowed as-of-right. The Project will require dimensional variances for height, floor area ratio, and rear yard. It will comply with the other applicable dimensional requirements of Article 66, including front and side yards and setback above street wall height. There is no minimum parking required for either dormitory or retail use, and the existing 15 surface parking spaces in Private Alley 937 will be relocated within the lower level of the Project. Loading requirements will be determined through Large Project Review. The Project will require a conditional use permit under Article 32, for construction in the GCOD.

Article 80B – Large Project Review

Pursuant to Article 80B of the Code, the Project – which exceeds 50,000 square feet – requires Large Project Review by the BPDA. The Proponent filed its Letter of Intent to initiate Large Project Review (the "LOI") with the BPDA in October 2018 (included herein as Appendix B).

This EPNF meets the requirements of Large Project Review by presenting details about the Project and providing an analysis of transportation, environmental protection, infrastructure, and other components of the proposed Project, to inform city agencies and neighborhood residents about the Project, its potential impacts, and proposed mitigation to address those potential impacts. Based on a comprehensive approach to address potential impacts similar to the level of information normally presented in a Draft Project Impact Report ("DPIR"), the Proponent requests that the BPDA, after reviewing public and agency comments on this EPNF and any further responses to comments made by the Proponent, issue a Scoping Determination Waiving Further Review pursuant to Section 80B-5(3)(d) of the Code.

1.6.2 Massachusetts Environmental Policy Act

The Project is not subject to environmental review by the Secretary of the Executive Office of Energy and Environmental Affairs under the Massachusetts Environmental Policy Act ("MEPA"), as the Project will not exceed any of the MEPA review thresholds set forth in 301 CMR 11.03.

1.7 Agency Coordination / Community Outreach

The Proponent is committed to delivering a mixed-use program that serves the long-term interests of the Fenway neighborhood.

The Proponent has proactively engaged with various neighborhood stakeholders over the past 18 months and looks forward to continuing to work closely with all parties in connection with the Project, including the broader community, the BPDA, City agencies, and the Impact Advisory Group.

The Proponent has proactively engaged various stakeholders to provide initial information and solicit feedback, including the following parties:

- Mayor’s Office of Neighborhood Services
- Ms. Shelia Dillon, Chief of Housing and Director of Neighborhood Development
- Mr. John Barros, Chief of Economic Development
- Boston Planning & Development Agency
- City Councilor Josh Zakim
- Fenway Community Development Corporation
- Fenway Civic Association
- Fenway Urban Village Committee
- Boston Arts Academy
- K Street Clubhouse
- Fenway Health
- The Emerald Necklace Conservancy
- Fenway Victory Gardens
- Kenmore Association
- Boston Red Sox
- Boston University
- Northeastern University
- Berklee College of Music
- Boston Transportation Department
- Boston Inspectional Services Department

1.8 Development Team

The following lists the key members of the development team for the Project:

Proponent	Scape Boylston, LLC (an affiliate of Scape) 22 Boston Wharf Road, 7th Floor Boston, MA 02210
Architect	Gensler One Beacon Street, 3rd Floor Boston, MA 02108 617-619-5723 Contact: Alexander Fernández
Associate Architect	Ab Rogers Design Lime Wharf, Vyner Street London E2 9DJ Contact: Ernesto Bartolini
Landscape Architect	Copley Wolff Design Group 10 Post Office Square, Suite 1315 Boston, MA 02109 617-654-9000 Contact: John Copley
Legal Counsel	Sullivan and Worcester LLP One Post Office Square Boston, MA 02109 617-338-2945 Contact: Victor Baltera
Civil Engineer, Transportation Engineer, Permitting Consultant	VHB 99 High Street, 10th Floor Boston, MA 02110 617-728-7777 Contact: Lauren DeVoe
Structural Engineer	McNamara Salvia Structural Engineers 101 Federal Street, 11th Floor Boston, MA 02110 617-850-4110 Contact: Adam McCarthy
Code Consultant	Code Red Associates 154 Turnpike Road, Suite 200 Southborough, MA 01772 617-500-7633 Contact: Nate Birmingham
Geotechnical and Environmental Engineer	McPhail Associates 2269 Massachusetts Avenue

	Cambridge, MA 02140 617-868-1420 Contact: Jonathan Patch
Mechanical Engineer and Sustainability Consultant	WSP USA 88 Black Falcon Avenue, Suite 210 Boston, MA 02210 617-210-1600 Contact: Jeremy Pinkham
Acoustic Engineer	Acentech 33 Moulton Street Cambridge, MA 02138 617-499-8005 Contact: Brian Masiello
Wind Engineer	RWDI 600 Southgate Drive Fuelph, ON NIG 4P6 Canada 519-823-1311 ext. 2305 Contact: Derek Kelly
Surveyor	Feldman Surveying Engineers 152 Hampden Street Boston, MA 02119 617-708-8615 Contact: Damien Raffle
Public Relations	InkHouse 260 Charles Street, Suite 200 Waltham, MA 02453 617-212-6817 Contact: Susan Elsbree
Arts & Culture Interior Designer	StudioTyak 745 Atlantic Avenue, 8th Floor Boston, MA 02111 917-705-6450 Contact: Stephen Martyak

1.9 Legal Information

1.9.1 Legal Judgments Adverse to the Project

The Proponent is not aware of any legal judgments in effect or legal actions pending that would prevent it from undertaking the Project.

1.9.2 History of Tax Arrears on Property in the City

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

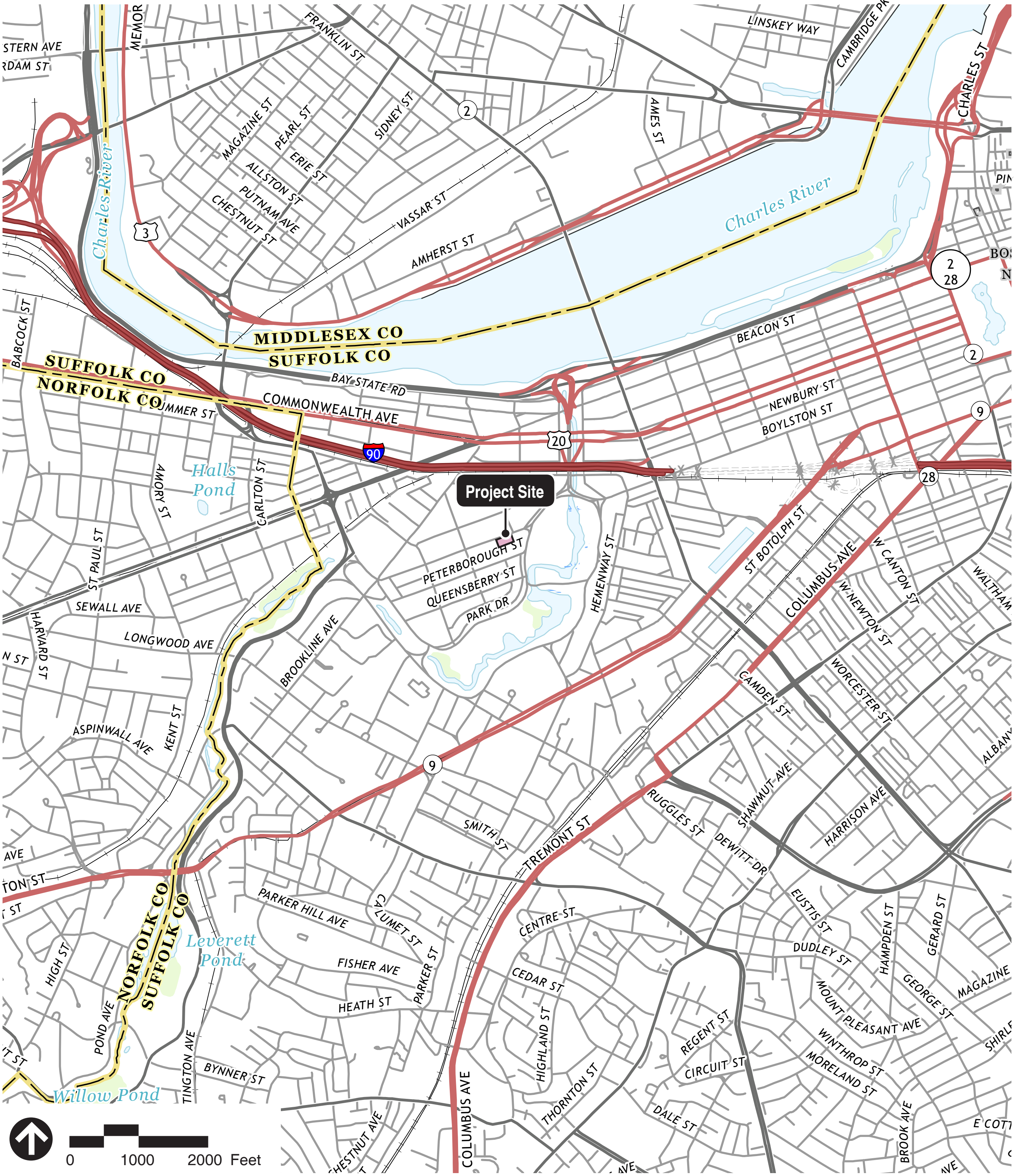
1.9.3 Site Control

The Proponent controls 1252-1268 Boylston Street through a long-term ground lease with the record owner of the property. The Proponent has entered into a contract to purchase the fee-simple title to 1270 Boylston Street.

1.9.4 Public Easements

A survey of the Project Site is included in Appendix F.

The survey does not indicate any public easements applicable to the Project Site. An easement for a private passageway benefiting certain nearby property owners runs along the easterly and southerly bounds of the Project Site. There are two private view easements pertaining to 1270 Boylston Street and there is a private easement for broadband communications systems.



Source: USGS US Topo

Figure 1.1

Locus Map

1252-1270 Boylston Street
Boston, Massachusetts

Source: ArcGIS Online Bing Aerial

Figure 1.2

Project Site Context

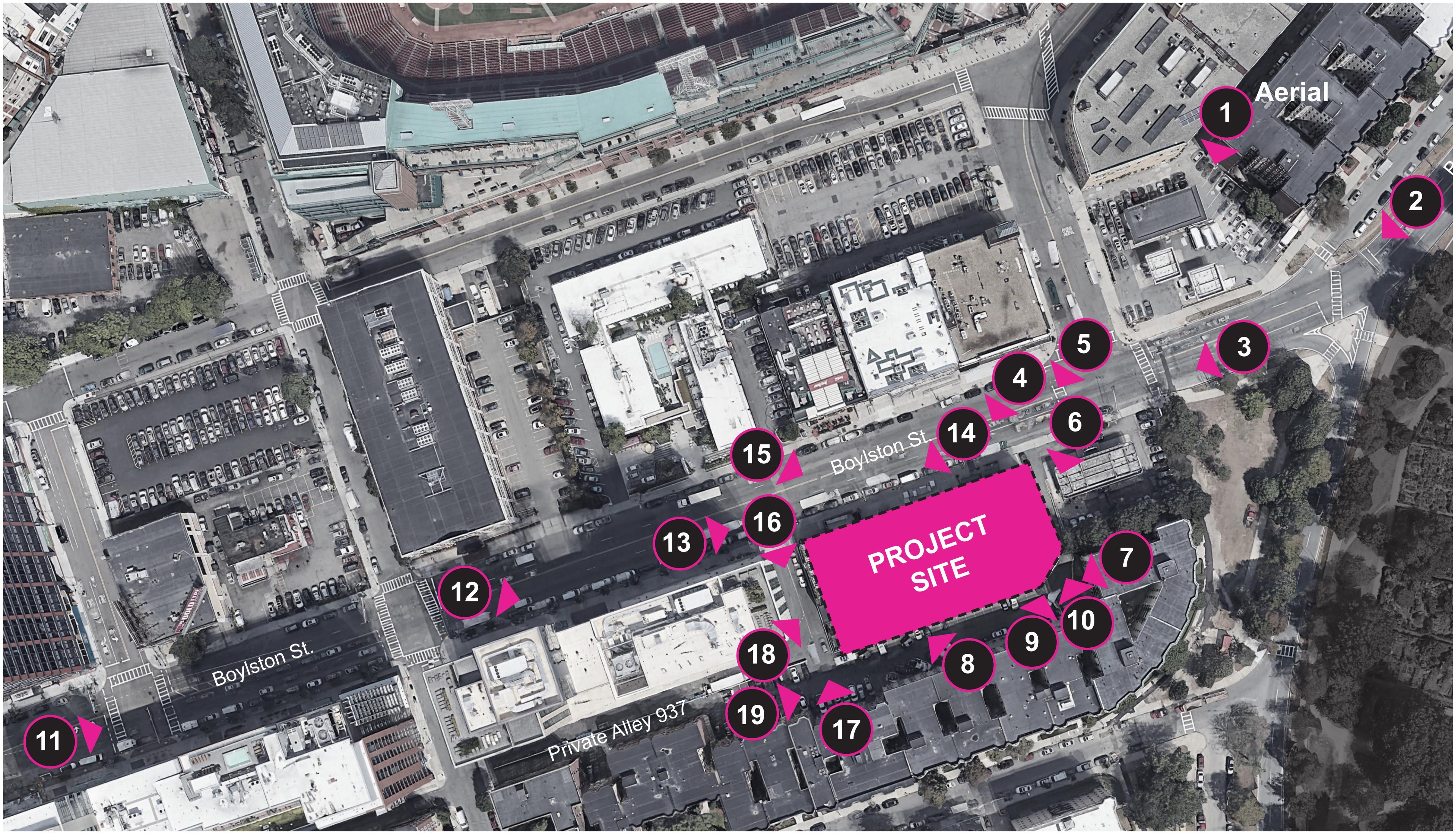
1252-1270 Boylston Street
Boston, Massachusetts

Source: ArcGIS Online Bing Aerial

Figure 1.3

Existing Conditions

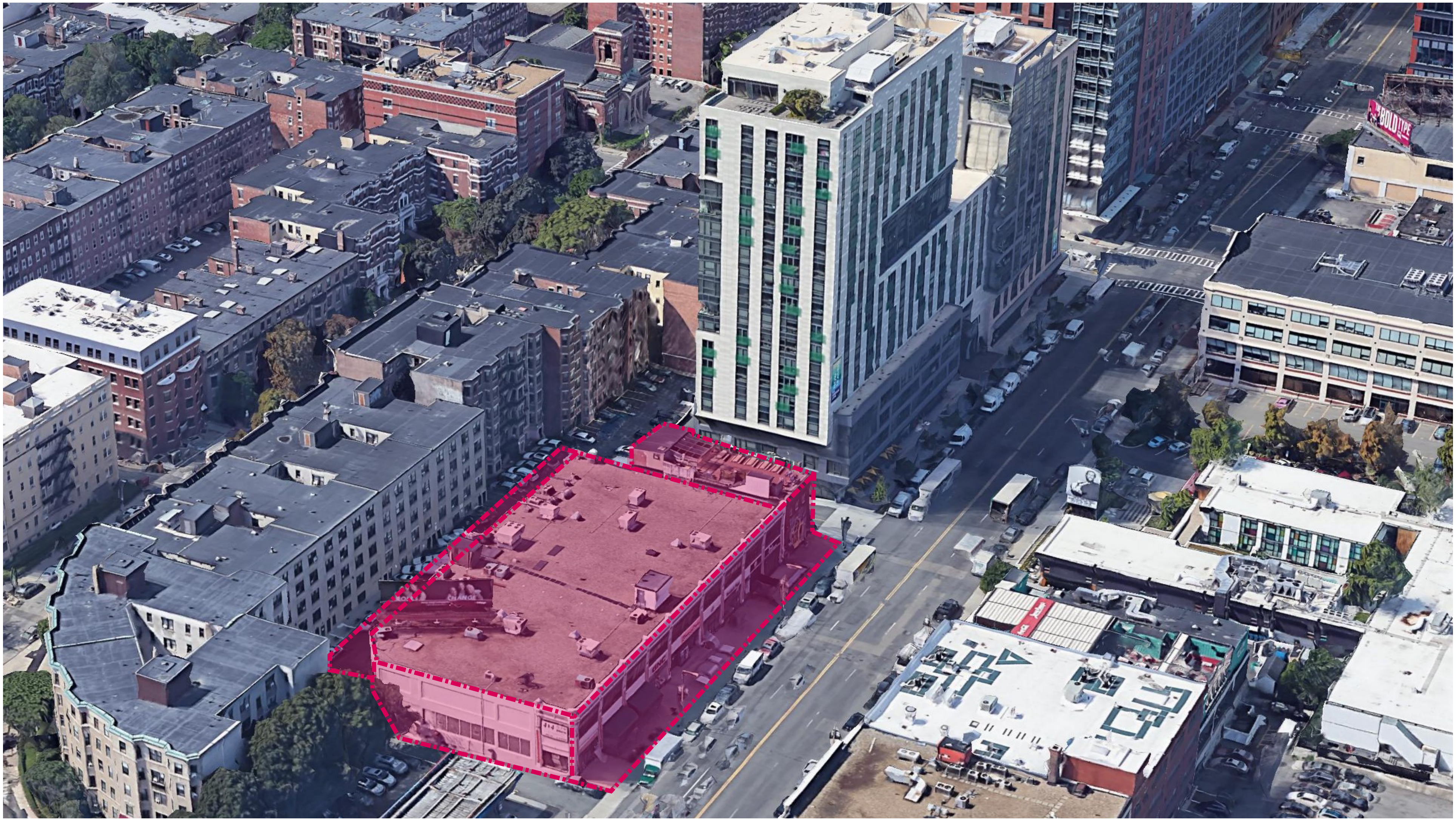
1252-1270 Boylston Street
Boston, Massachusetts



Source: Gensler

Figure 1.4a
Existing Site Photographs

1252-1270 Boylston
Boston, Massachusetts



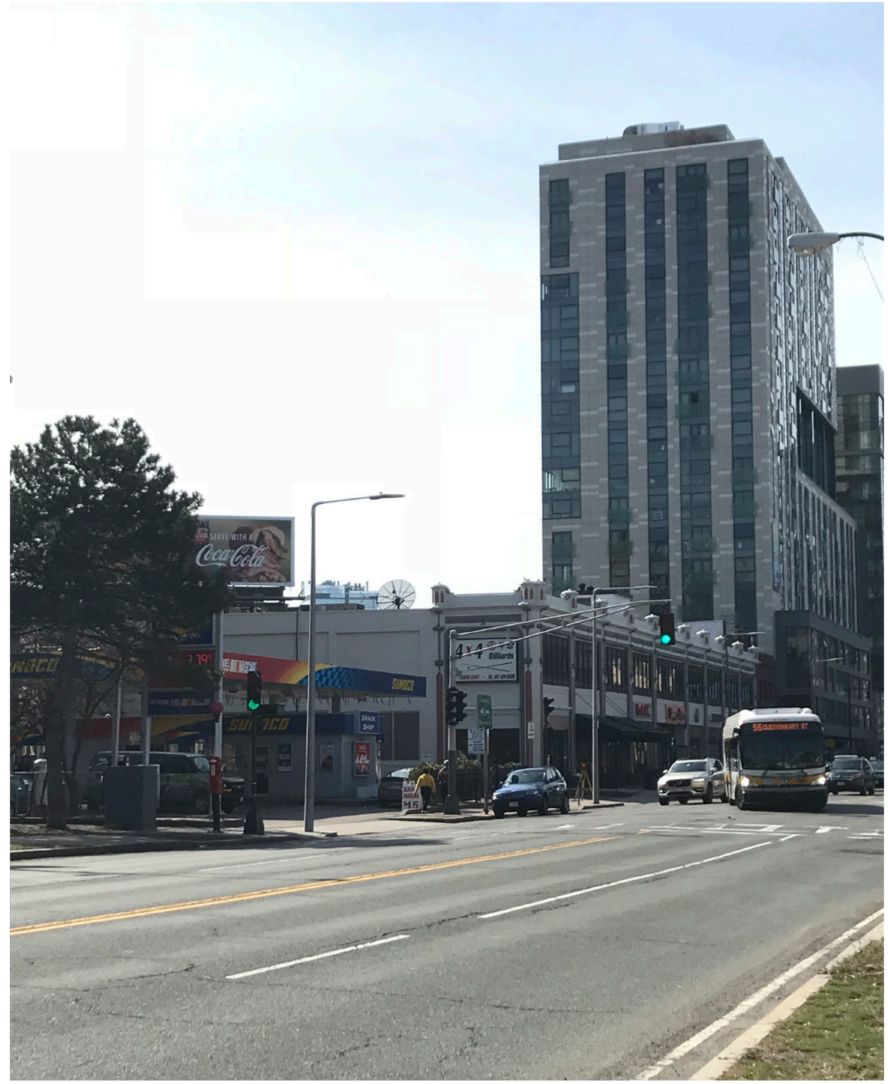
1. Aerial View

Source: Gensler

Figure 1.4b
Existing Site Photographs

1252-1270 Boylston
Boston, Massachusetts

2. Boylston Street, Boston, MA. Looking West.



3. Boylston Street, Boston, MA. Looking Southwest.

Source: Gensler

Figure 1.4c
Existing Site Photographs

1252-1270 Boylston
Boston, Massachusetts

4. Boylston Street, Boston, MA. Looking South.

5. Boylston Street, Boston, MA. Looking Southwest.

6. Boylston Street, Boston, MA. Looking South to Private Alley 937.

Source: Gensler

Figure 1.4d
Existing Site Photographs

1252-1270 Boylston
Boston, Massachusetts

7. Private Alley 937, Boston, MA. Looking West.

8. Private Alley 937, Boston, MA. Looking Northwest.

9. Private Alley 937, Boston, MA. Looking North.

10. Private Alley 937, Boston, MA. Looking North.

Source: Gensler

Figure 1.4e
Existing Site Photographs

1252-1270 Boylston
Boston, Massachusetts

11. Boylston Street, Boston, MA. Looking Southeast.

12. Boylston Street, Boston, MA. Looking Southeast.

Source: Gensler

Figure 1.4f
Existing Site Photographs

1252-1270 Boylston
Boston, Massachusetts

13. Boylston Street Sidewalk, Boston, MA. Looking East.

14. Boylston Street Sidewalk. Boston, MA. Looking West.

15. Boylston Street, Boston, MA. Looking Southeast.

Source: Gensler

Figure 1.4g
Existing Site Photographs

1252-1270 Boylston
Boston, Massachusetts

16. Viridian Alley, Boston, MA. Looking South

17. Viridian Alley, Boston, MA. Looking North.

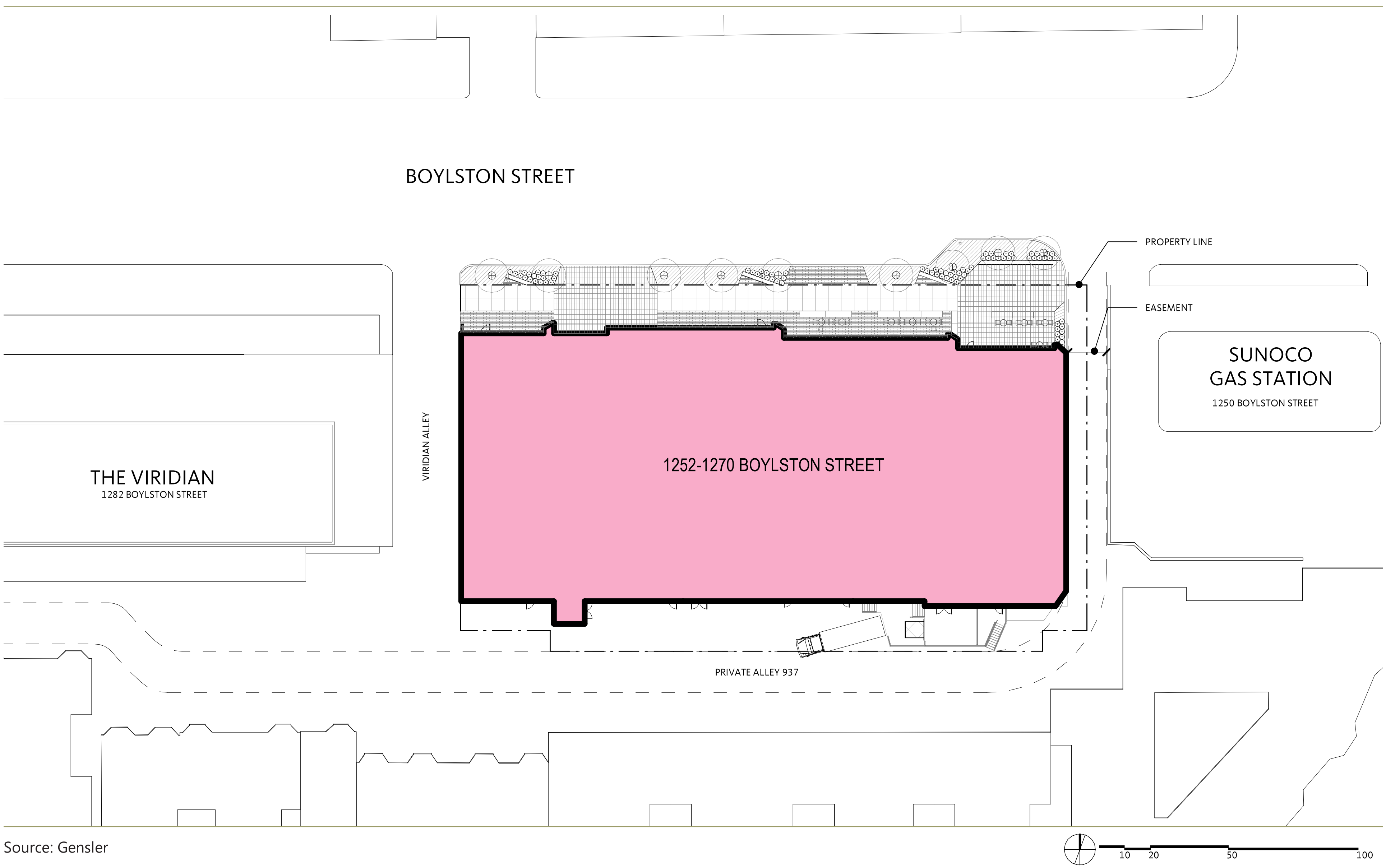
18.Viridian Alley, Boston, MA. Looking North.

19. Private Alley 937, Boston, MA. Looking East.

Source: Gensler

Figure 1.4h
Existing Site Photographs

1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 1.5
Proposed Site Plan

1252-1270 Boylston
Boston, Massachusetts

2

Urban Design

This chapter describes the existing urban context of the Project Site and discusses the planning principles and design concepts for the Project. It also describes urban design characteristics and public realm improvements included as part of the Project. Supporting graphics are provided, including massing diagrams, building floorplans, building sections, building elevations, and view perspectives.

2.1 Summary of Key Findings and Benefits

The key findings and benefits of the Project related to urban design include:

- The Project addresses the acute (and exacerbating) housing challenges in the Fenway neighborhood, where the academic population is exerting enormous pressure on the supply-constrained housing market, displacing the workforce and families and driving-up rental costs. Due to the major disparity in the neighborhood's housing stock – a spectrum presently characterized by, (i) aging product that has reached the end of its useful life on one end, and, (ii) luxury condominiums on the other end – the academic population, the workforce and families are all competing for the limited amount of 'middle-market' neighborhood housing.
- The Project will have a direct, positive impact on the current 'supply & demand' imbalance in the Fenway neighborhood, alleviating stress on the 'middle-market' segment of housing spectrum. Through the combination of meaningful scale, prudent programming, intelligent design and operational acumen, the Project will generate the magnetism required to draw a portion of the academic population out of the existing neighborhood housing stock and into the Proponent's 'purpose-built' product, thereby returning those existing units to the workforce and families, and dampening demand-driven rent increases.
- Importantly, the Project will be 'purpose-built' for academic residents – graduate and undergraduate – of the twenty-first century. The full-service building will be operated – 24 hours per day, seven days per week – by full-time, extensively-trained, professional Scape employees. The newly constructed building will adhere to – and continue to comply with, at all times – the most current life-safety systems requirements and unit-occupancy limits.
- The Proponent's comprehensive onsite staff – many of whom will hopefully be recruited from the Fenway neighborhood – will operate the building with a steadfast focus on the health and wellness of its residents. Furthermore, the onsite staff will exemplify the Proponent's unwavering commitment to community citizenship, neighborhood engagement and consistent communication.

- The Proponent perceives the need for graduate academic accommodations in the Fenway neighborhood as particularly severe – and often overlooked – and, therefore, the Project will include environments to serve the graduate-level scholars driving the City's research and intellectual exploration.
- The contextual design of the Project respects the commercial urban fabric delivered along the Boylston Street corridor in recent years, while also expressing the neighborhood's architectural heritage through a distinct masonry façade.
- The Project also consists of landscape and streetscape improvements to cultivate pedestrian activity and enhance the public realm, which is currently inhibited by the deficient existing onsite conditions.
- The Boylston Black Box will be an LGBTQ-centric venue for the performing arts – anchored by a 120-seat theater – which will be delivered and operated on a not-for-profit basis.
- The Boylston Black Box will seek to honor the history of the LGBTQ community's important relationship with the Project Site and with The Fens and will serve as an iconic location for the LGBTQ community going forward.
- The Project aligns with the key principles of the Fenway Urban Village Plan and the City's arts and cultural objectives.

2.2 Neighborhood Context

Located at the eastern terminus of the Boylston Street corridor, the Project Site serves as both a gateway and a transition.

The immediate context of the Project Site varies in both scale and typology. To the south lie residential neighborhoods characterized by mid-rise structures often organized around traditional courts that are both internal or facing the street. The predominant material is brick, often folded to accommodate bay windows and oriels which creates a steady vertical cadence. Towards the southeast is the Back Bay Fens, and immediately west along Boylston Street are predominantly larger, newly developed mixed-use projects. The architectural expression along Boylston Street varies considerably and speaks to revitalization efforts, including a number of high-rise, multi-family residential and commercial buildings. One block to the north is Fenway Park. Refer to Figure 1.2 for neighborhood context.

2.3 Design Concepts and Development

The Project anchors the eastern portion of the Boylston Street corridor. Through thoughtful massing, multi-dimensional stepping and material articulation, the Project aims to serve as both a responsible neighbor and an iconic feature of the urban environment. Refer to Figures 2.1a through 2.1i for all building floorplans.

The ground floor of the building is predominantly programmed with activated, permeable retail to further enhance the pedestrian experience and public realm along Boylston Street. Towards the western portion of the Project Site is the main lobby entrance for the private academic accommodations. The rhythmic pattern of the prominent masonry piers that land at the sidewalk allow for appropriately sized retail glass storefronts to be interspersed along the Boylston facade. The storefront is then stepped back on the second floor to reduce the scale of the street wall and create a comfortable pedestrian experience. The copper elements of the facade bring definition and iconic character to the building.

2.3.1 Height and Massing

As shown in Figures 2.2a and 2.2b, the building form is broken down into individual elements stepping down in a multi-dimensional capacity from the northwest to the southeast. This creates a building form of interest and appropriate scale. Along Boylston Street, the building steps in eight feet from west to east enhancing the public realm. In addition, these setbacks allow for the building to read as distinct vertical elements, an expression which aligns with the architecture of the neighborhood. Refer to Figure 2.3 for building sections.

The massing along the southern portion of the Project Site is designed to provide maximum separation from the neighbors along Private Alley 937.

2.3.2 Character and Exterior Materials

The building elevations, demonstrated in Figures 2.4a and 2.4b, depict the material palette for the Project, which complement and extend the urban fabric of the surrounding Fenway neighborhood. Above the first two levels, the façade is comprised of masonry and pre-patinated copper, influenced by the context of the surrounding neighborhood. Authentic and variegated, this material reflects the nearby urban fabric. This façade treatment represents the broader design intent to embrace traditional materials in contemporary ways.

Window fenestration is another important element of the design. Creative articulation of the window articulation results in a textured dynamic facade and creates a dialogue with the traditional Boston bay windows of the neighborhood. The variety of window configurations reflecting the interior unit types and various bay window projections help to reduce the overall visual scale of the building. Refer to Figures 2.5a and 2.5b for aerial views of the Project and Figure 2.6a and 2.6b for Project renderings.

2.3.3 Signage

All signage throughout the Project Site will complement the architectural identity of the buildings. Signage will be thoughtfully located and designed to generate an inviting streetscape appropriately-scaled for the location. The existing 20- by 60-foot billboard will be replaced with a comparably-sized commercial, digital sign integrated into the building facade, depicted in Figure 2.7. All retail signage will be reviewed for neighborhood context and character attribution to the Boylston Street corridor, while using the City as guidance for design approval.

2.4 Public Realm Improvements

All public realm improvement areas have been thoughtfully designed for both resident and public community use, as shown in Figure 2.8. These improvements include the construction of an entirely new streetscape that runs the full length of the Project Site, east-west along Boylston Street. Enhancements to the streetscape will replace existing crumbling sidewalks, concrete ramps, metal railings, and above-grade electrical equipment. All improvements will comply with Boston Complete Streets Guidelines and be modeled after the "Downtown Mixed-Use" street type guidelines. The streetscape will create a sense of continuity and transparency along the Boylston corridor through the use of glass facade, retail storefronts, modern, precast concrete pavers, an improved accessible pedestrian zone, and a landscaped stretch adjacent to the street side curb. The sidewalk will be interspersed with large masonry sculpted planters, as well as integrated wood-top benches for public use. Specialty paving materials will be introduced along the north portion of the Project Site. The paving material at both locations is intended to be one by two-foot granite pavers. The northeastern portion of the Project Site will include more densely planted trees and vegetation and will act as a gateway entry into the improved pedestrian realm.

Further improvements include the installation of new street lamps and waste bins which will match and continue the current standards along Boylston Street. The Project will also include a new bicycle lane, design in conjunction with BTD, which will enhance safety and security for bicyclists. Below-grade cisterns will be provided to promote groundwater recharge of the Project Site and assist in replenishing the groundwater table.

2.4.1 Accessibility

The Proposed Project will consciously improve accessibility around the Project Site. Site conditions will provide a paved, accessible path-of-travel to building entrances and egresses as required by the Massachusetts Architectural Access Board (MAAB) and the City's Commission of Person with Disabilities Advisory Board. The proposed sidewalk will meet Boston Complete Streets Guidelines. Refer the BPDA Accessibility Checklist provided in Appendix C. Refer to Figures B.1-B.8 for site accessibility.

2.5 Open Space and Landscaping

Open space for the Project will be provided at the newly implemented ground-floor streetscape along Boylston Street to the north of the proposed building, as described in Section 2.4 above and in Figure 2.8.

The proposed landscaping along the streetscape consists of sculpted angled planters which will house varied planted groundcover, vibrant perennials and shrubs, as well as City approved street trees. The street trees are planned to be *Gleditsia triacanthos* (Honey locust) and will be appropriately spaced along the sidewalk to relate to both the column spacing of the proposed building as well as to create more green density at the northeastern portion of the Project Site.

2.6 Boylston Black Box Design and Programming

With regards to designing and programming the Boylston Black Box, the Proponent has proactively engaged stakeholders through a series of focus groups, working sessions and performance attendances. This research and development pertaining to the Boylston Black Box has been guided by the following key principles:

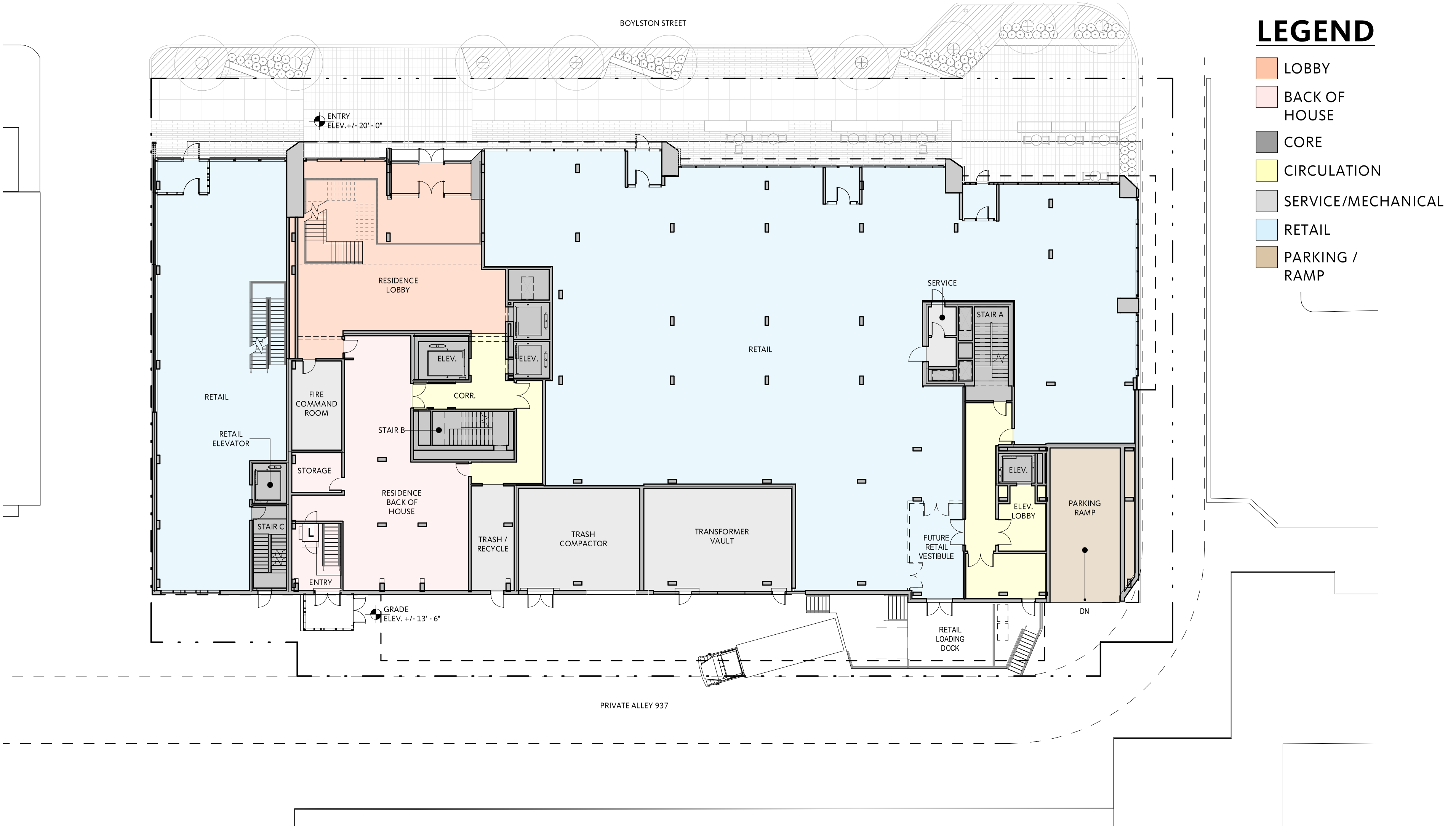
- *Listen* to Fenway-based arts and cultural organizations in order to develop a venue that addresses and supports the needs of limited-budget, small to mid-sized performance groups.
- *Celebrate* the legacy of – and the preservation of – the Project Site's long-standing affiliation with the LGBTQ community by delivering a dedicated, permanent beacon for LGBTQ-centric arts and culture.
- *Curate* a comprehensive team of designers, artists and engineers to deliver a purpose-built, versatile space well-suited for a broad range of performing arts disciplines to maximize utilization.
- *Partner* with an operational team that is aligned with the interests of the Fenway neighborhood – and objectives of the City – to position the venue for long-term success.

This collaborative process – which remains ongoing – has consistently sought to balance creativity and practicality. While the design incorporates bespoke creative elements (for example, the feature staircase), the layout bears the hallmarks of thoughtful space-planning (for example, the storage areas and dressing rooms).

Importantly, various tangible and intangible components of the design have been informed by first-hand experiences shared by neighborhood participants (for example, the personal-safety concerns associated with long, narrow corridors).

To ensure versatility, drive consistent utilization and accommodate a range of programming (i.e. across a breadth of genres and content), the Proponent continues to engage directly with various prospective users of the space, including The Theater Offensive, the Gold Dust Orphans and Ryan Landry, the Boston Arts Academy and Fenway Health. The design team is led by Stephen Newbold at Gensler, Ernesto Bartolini at Ab Rogers Design and Stephen Martyak of StudioTyak.

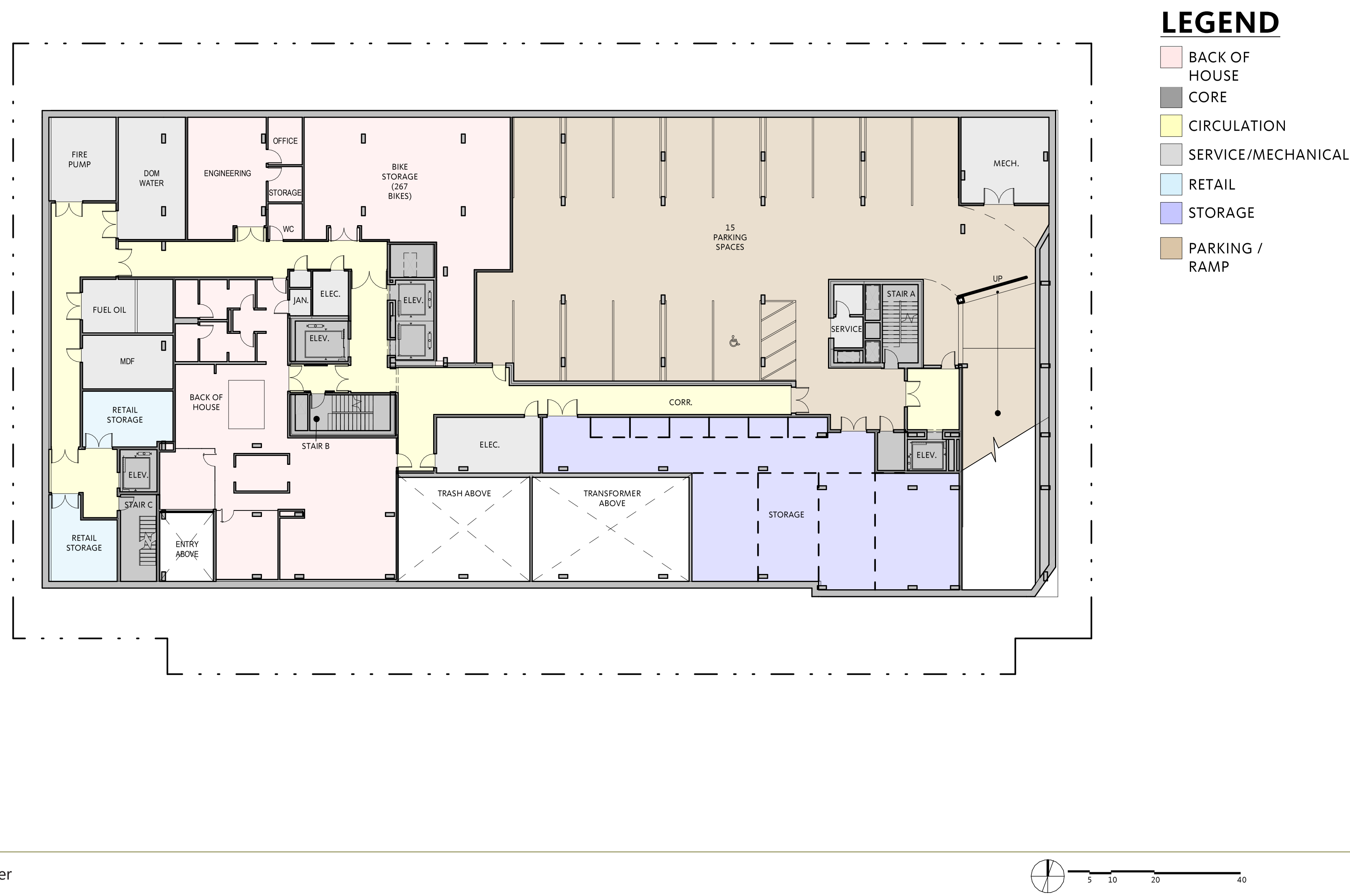
The bona fide arts and cultural performance venue will consist of a main entrance fronting on Boylston Street and a feature staircase leading to the approx. 17-foot 'double-height' space below-grade. In addition to the 120-seat theater, the program will also include 'flex' space which will be utilized for various purposes (i.e. suitable for small-group meetings, events and seminars, or alternatively, able to accommodate food & beverage catering to accompany performances).



Source: Gensler

Figure 2.1a
Floor Plan - Ground Floor

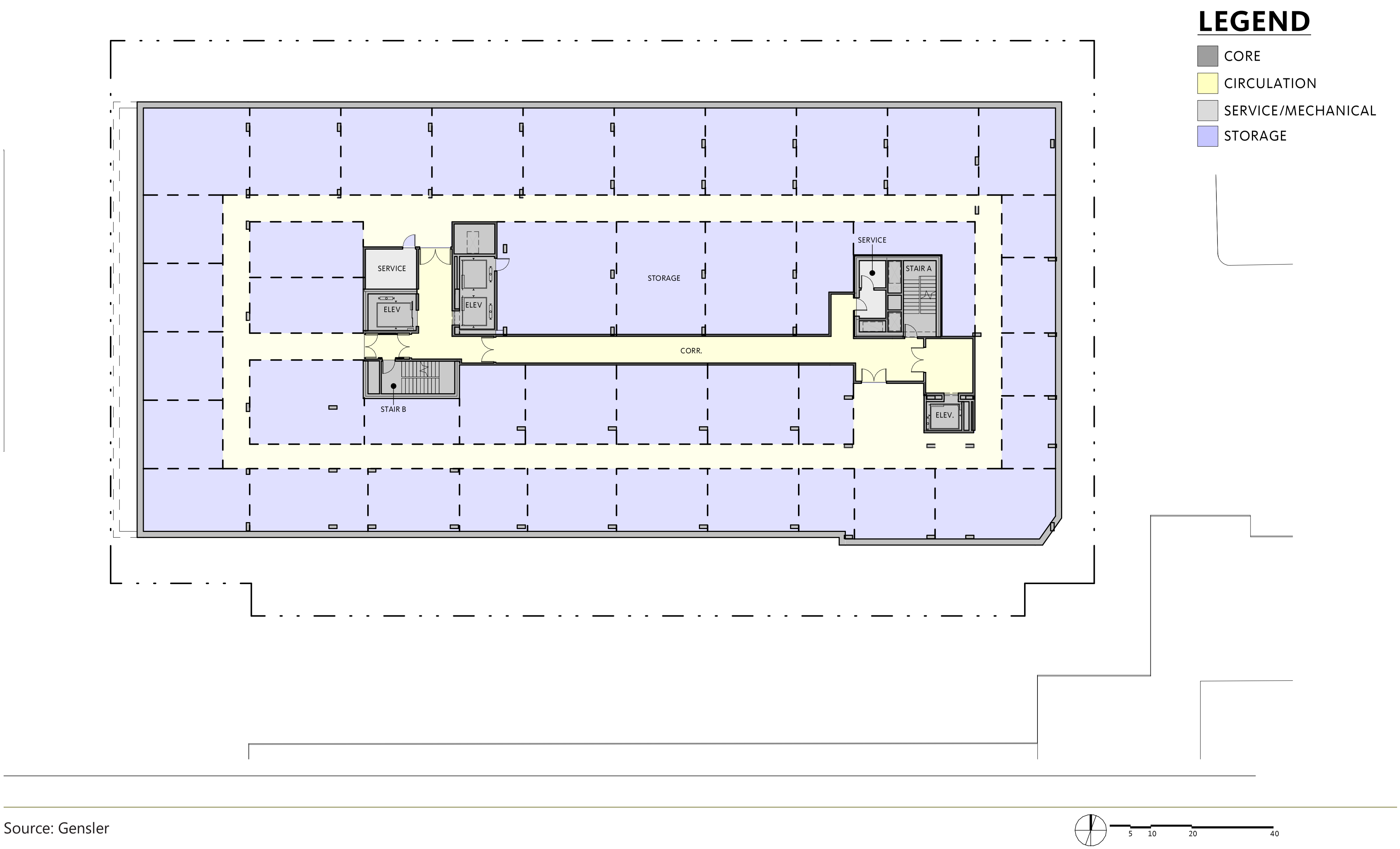
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.1b
Floor Plan - Basement
Level B1

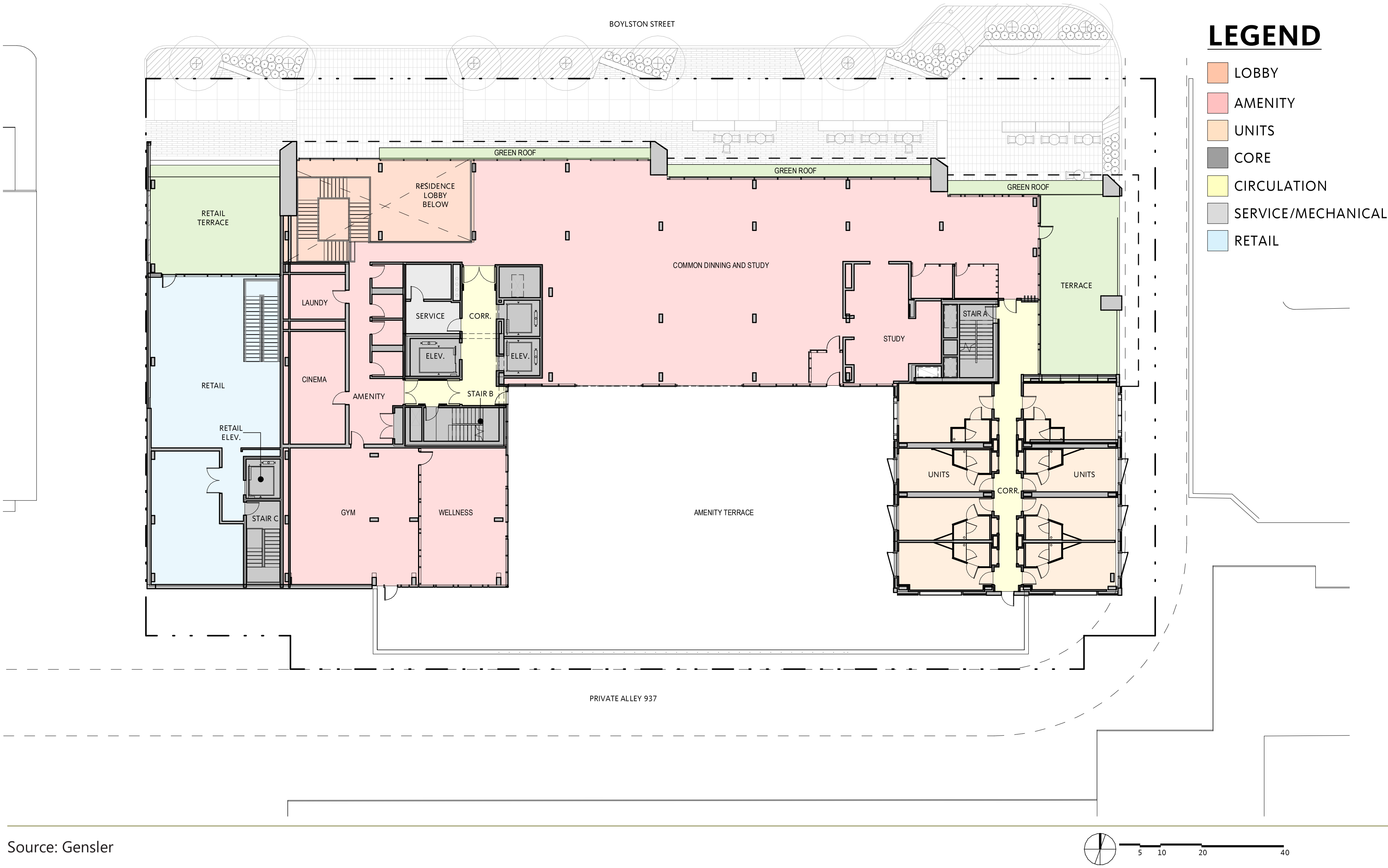
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.1c
Floor Plan - Basement
Level B2

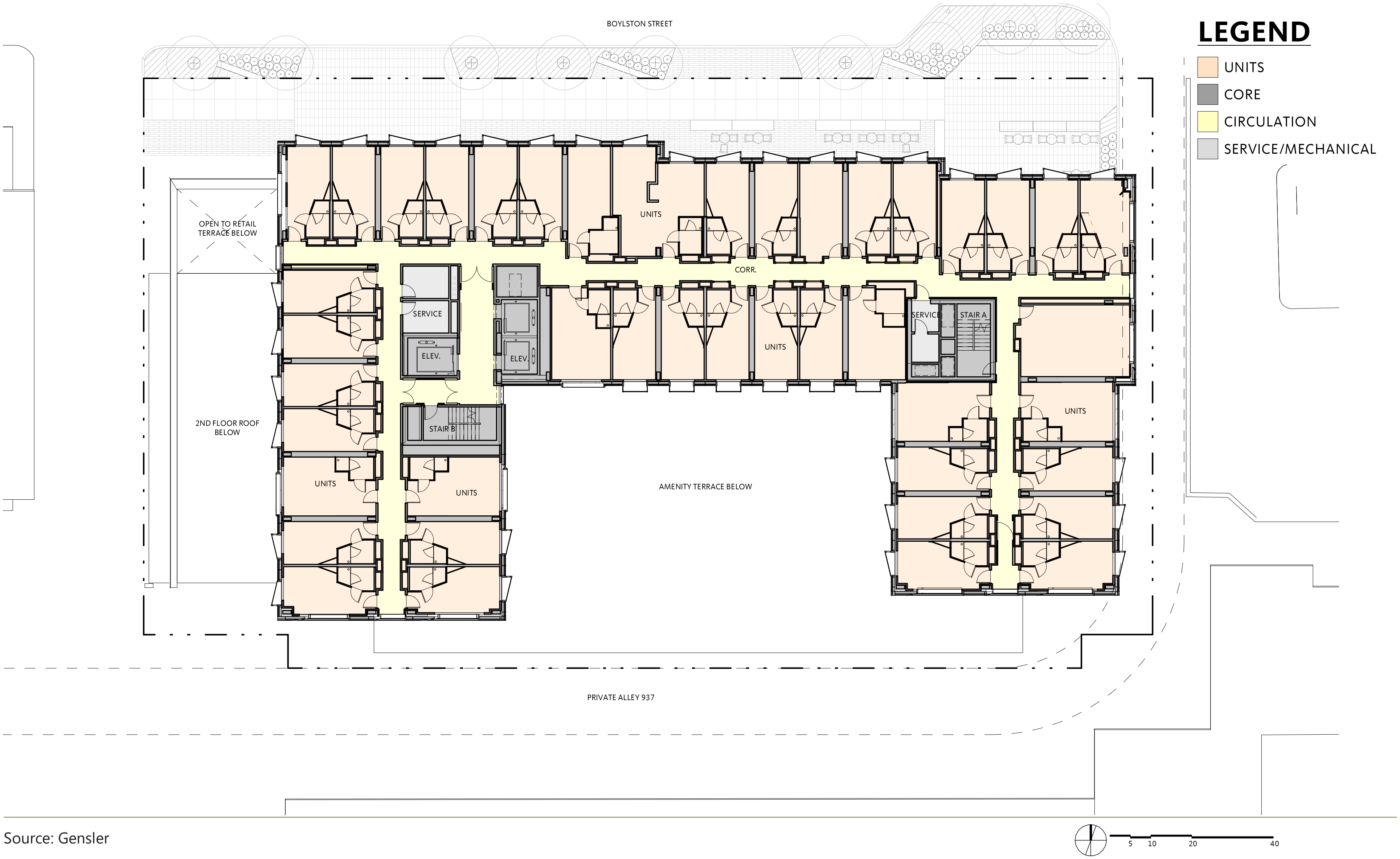
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.1d
Floor Plan - Level 2

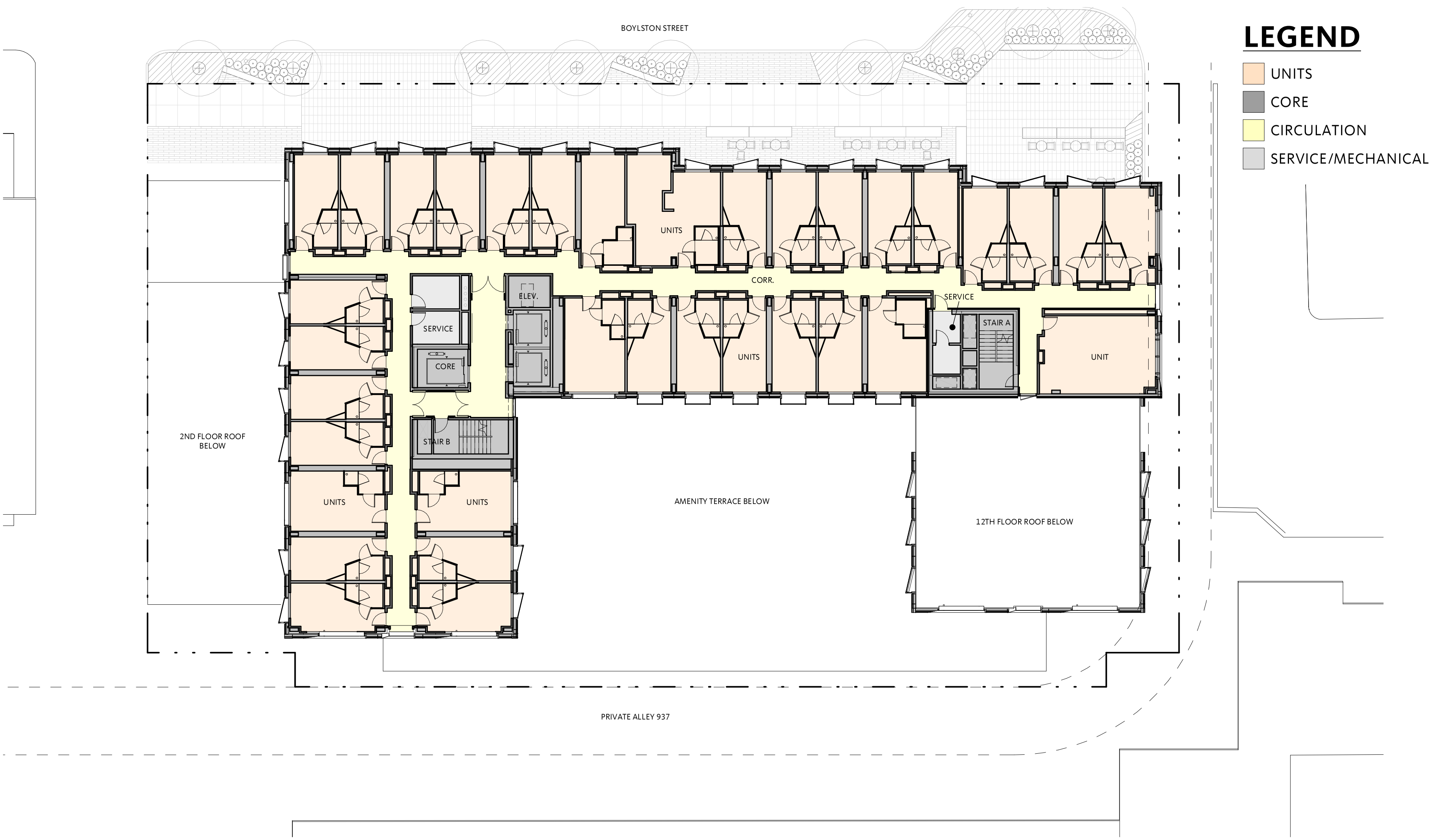
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.1e
Floor Plan - Typical Levels 3-12

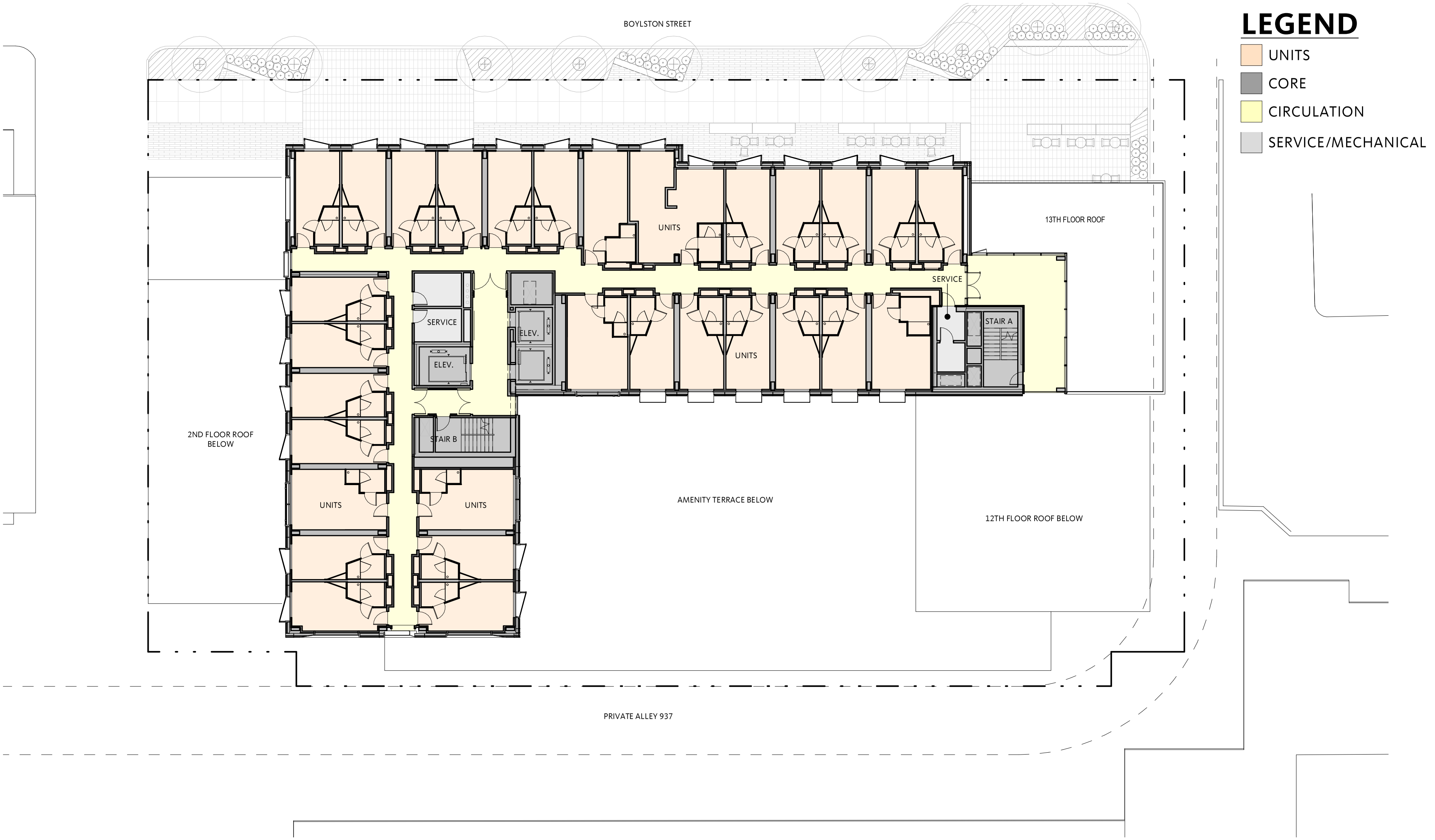
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.1f
Floor Plan - Typical Level 13

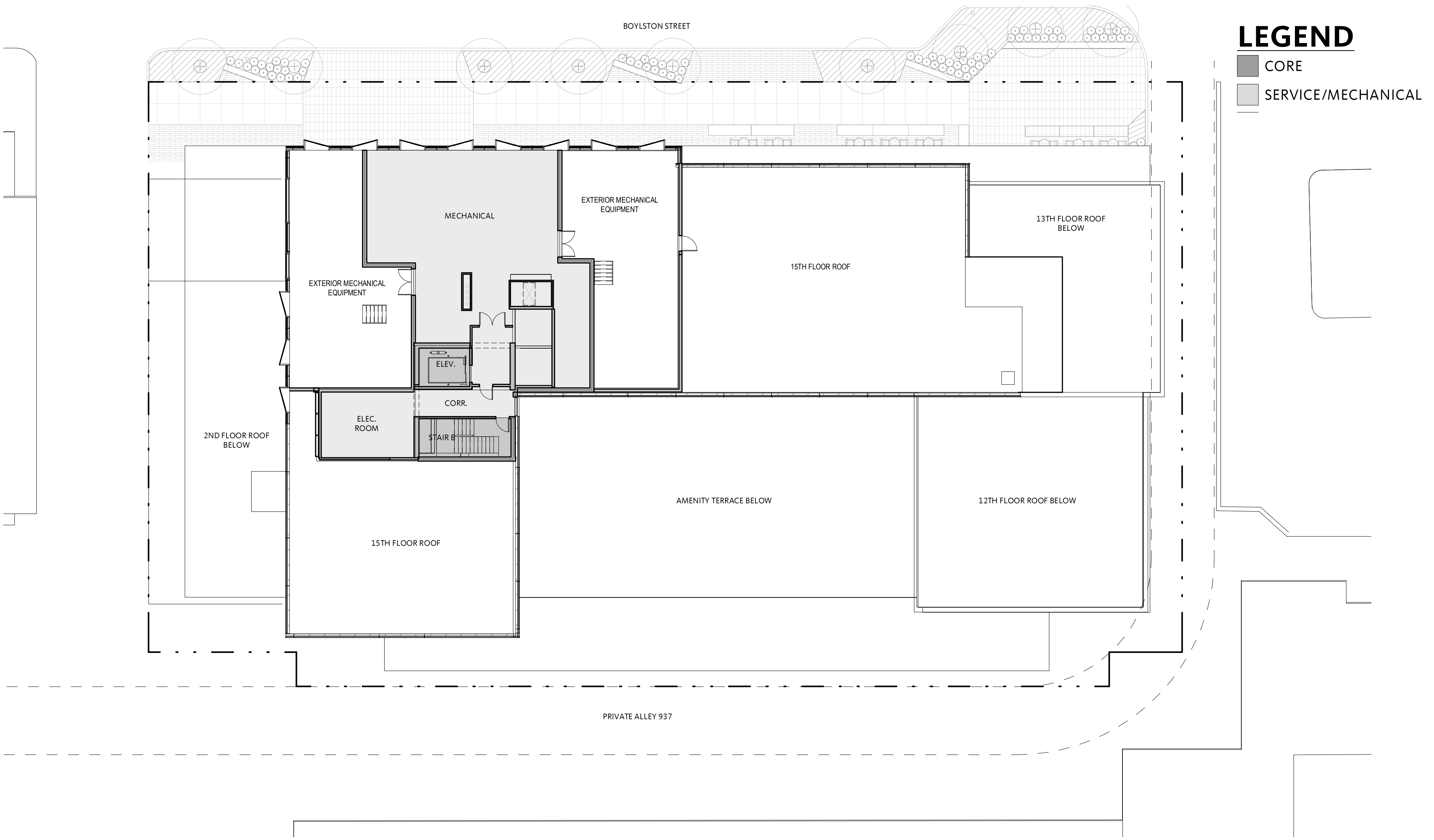
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.1g
Floor Plan - Levels 14-15

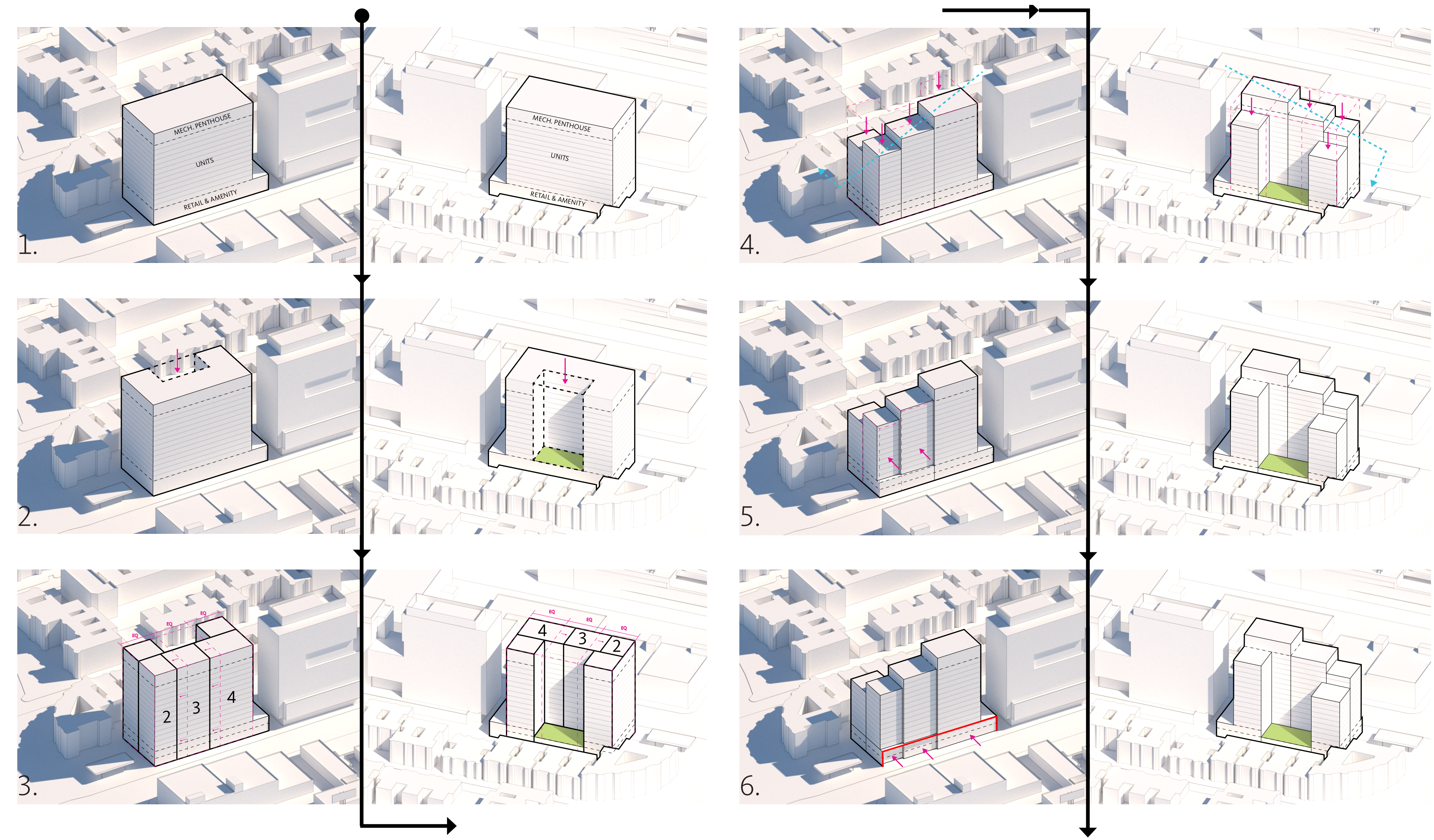
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.1h
Floor Plan - Roof
Mechanical Penthouse

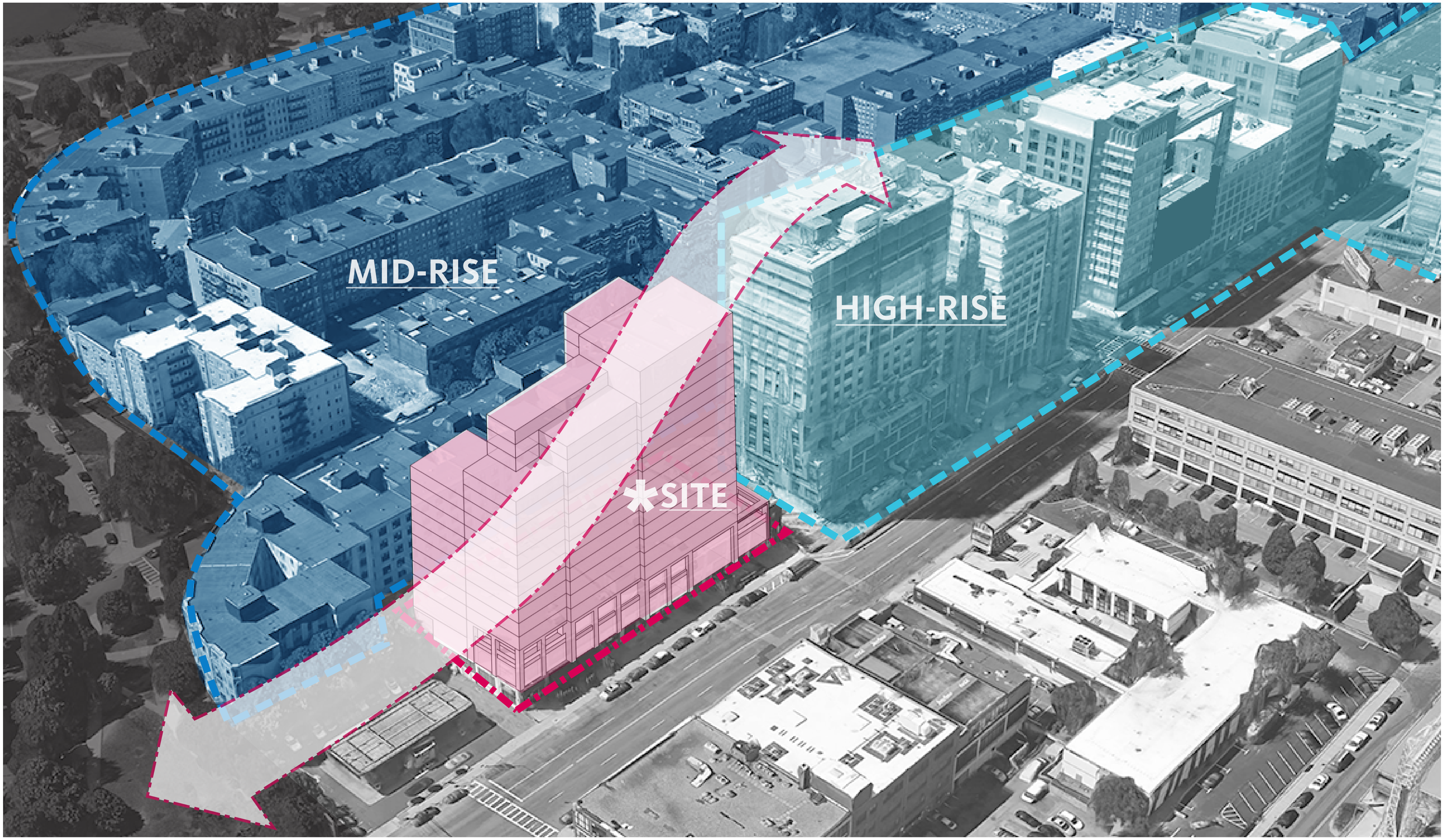
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.2a
Building Massing Strategy

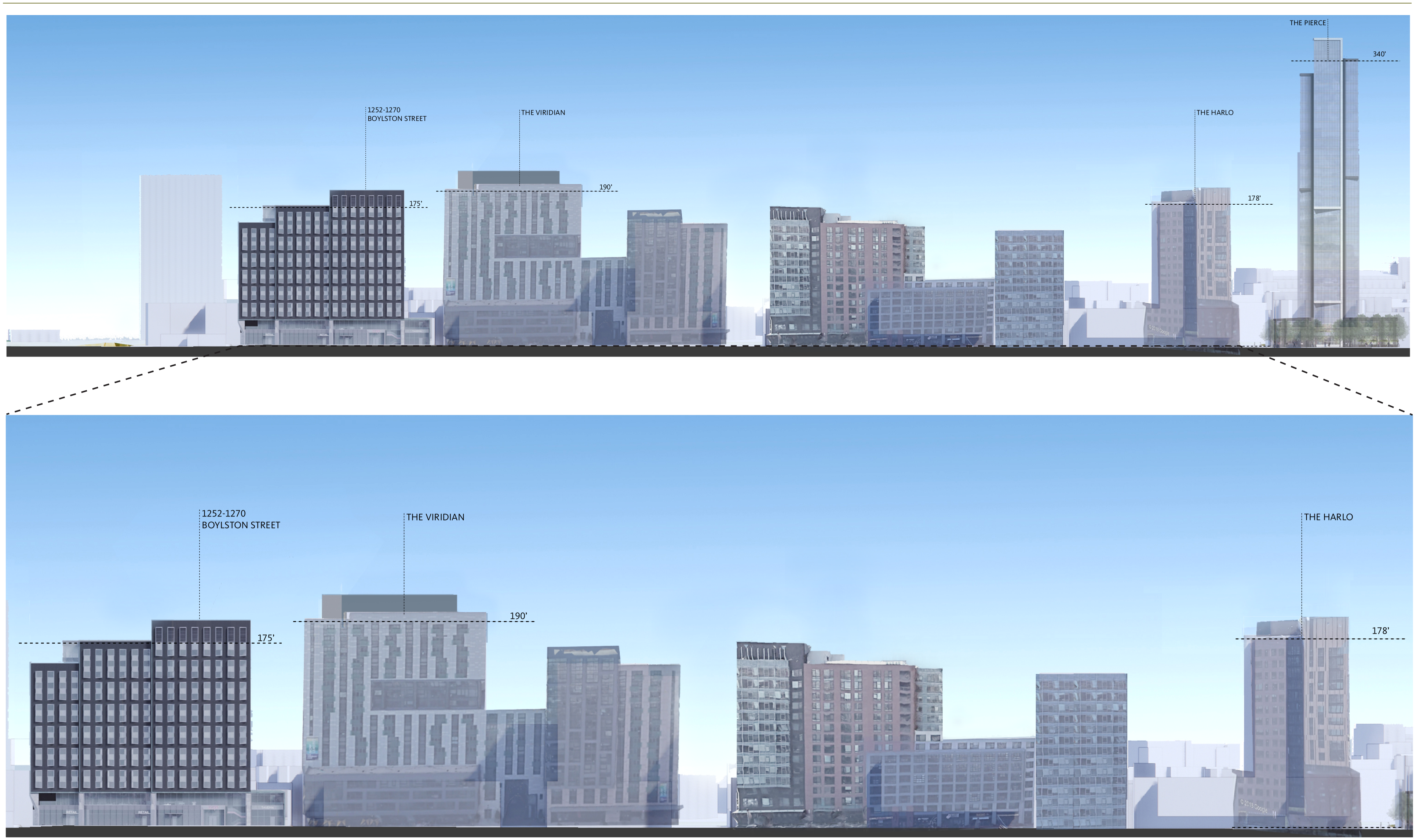
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.2b
Building Massing Strategy

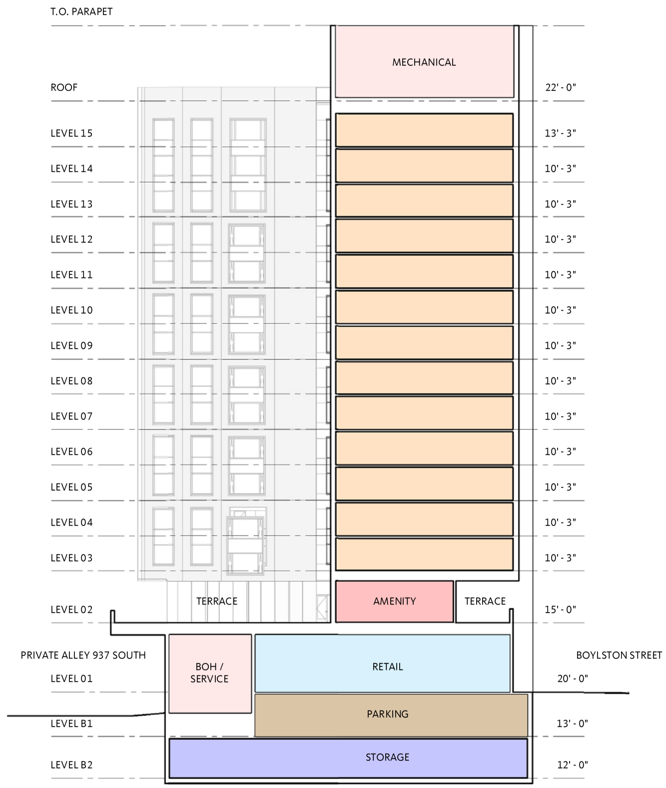
1252-1270 Boylston
Boston, Massachusetts



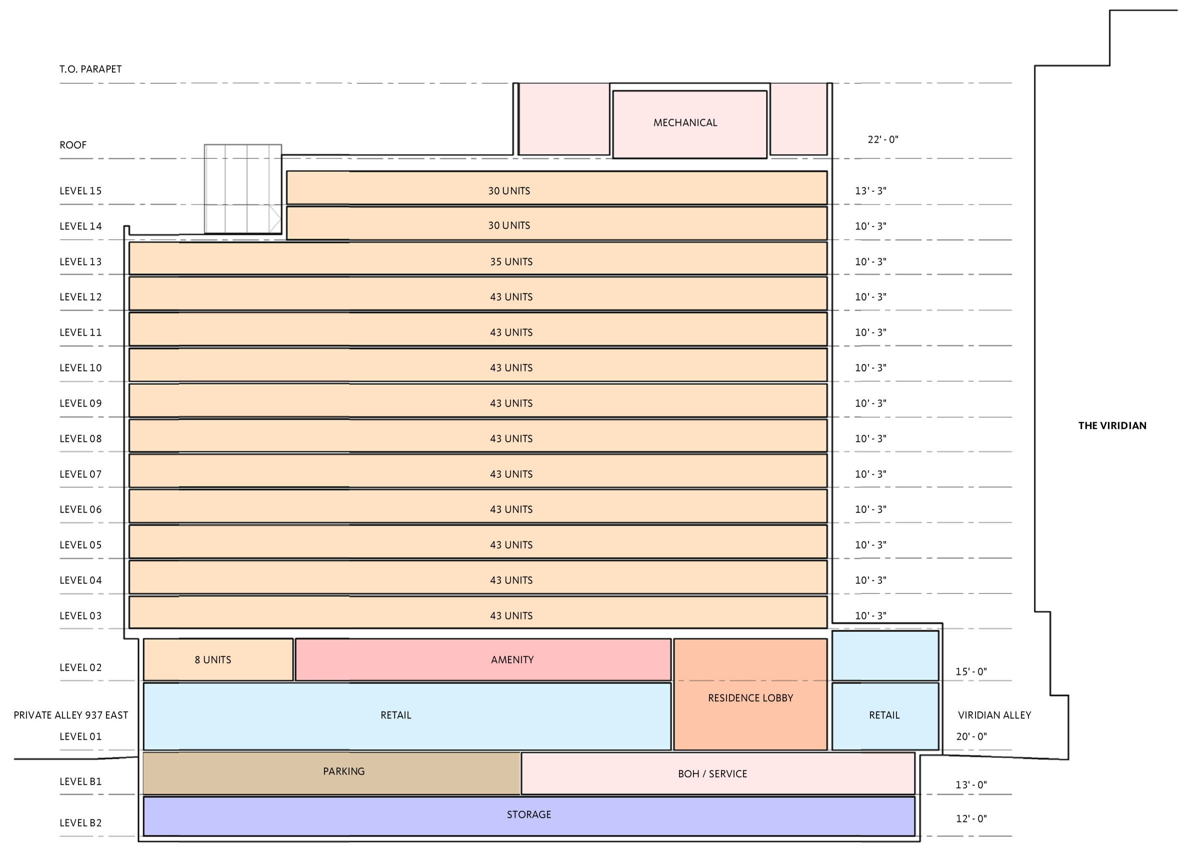
Source: Gensler

Figure 2.2c
Building Massing Strategy

1252-1270 Boylston
Boston, Massachusetts



Section Cut North / South Looking West



Section Cut East / West Looking South

Source: Gensler

Figure 2.3
Building Sections

1252-1270 Boylston
Boston, Massachusetts

Building Elevation - North

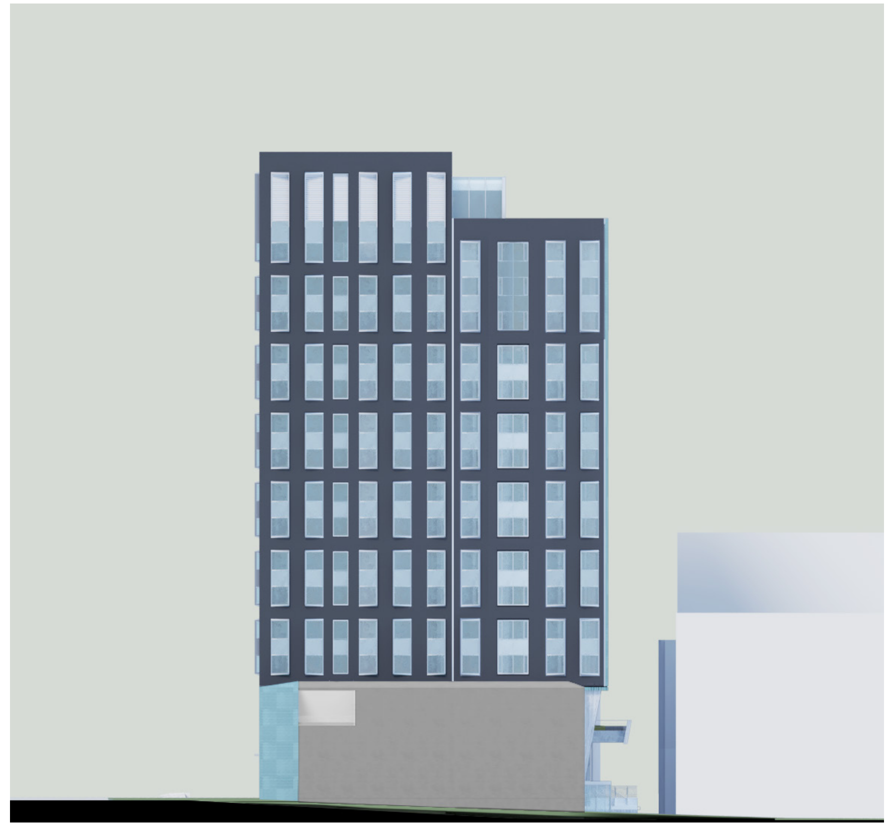
Building Elevation - East

Source: Gensler

Figure 2.4a
Building Elevations

1252-1270 Boylston
Boston, Massachusetts

Building Elevation - South



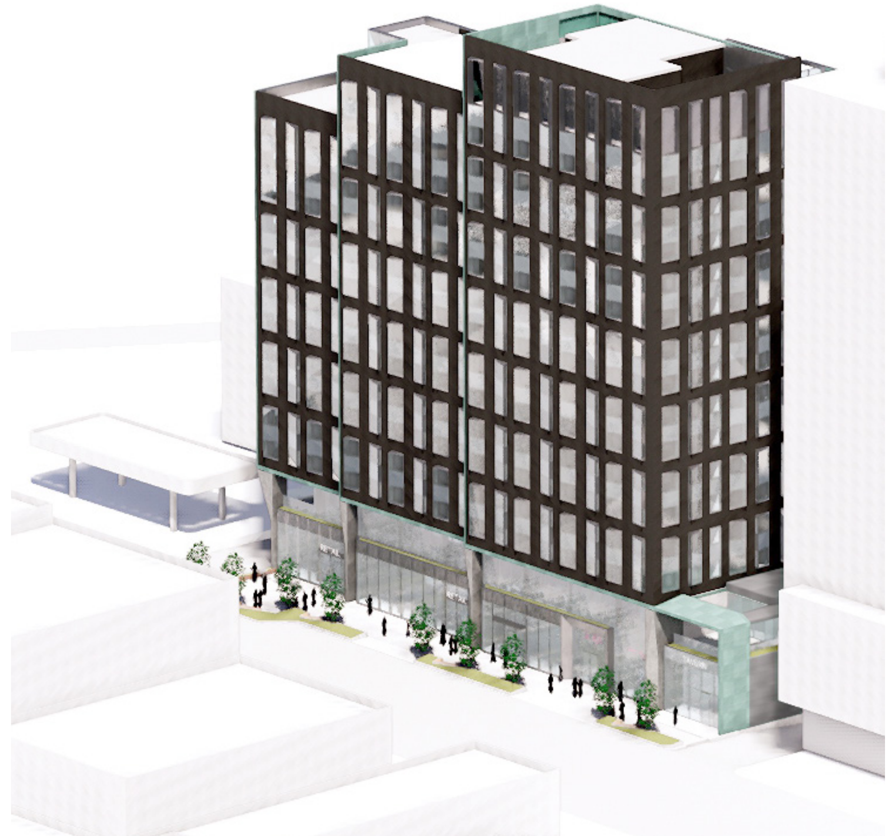
Building Elevation - West

Source: Gensler

Figure 2.4b
Building Elevations

1252-1270 Boylston
Boston, Massachusetts

Aerial View - Looking Southwest



Aerial View - Looking Southeast

Source: Gensler

Figure 2.5a
Aerial Axon Views

1252-1270 Boylston
Boston, Massachusetts

Aerial View - Looking Northeast

Aerial View - Looking Northwest

Source: Gensler

Figure 2.5b
Aerial Axon Views

1252-1270 Boylston
Boston, Massachusetts

Boylston Street Looking Southwest

Source: Gensler

Figure 2.6a
Project Rendering
Looking Southwest

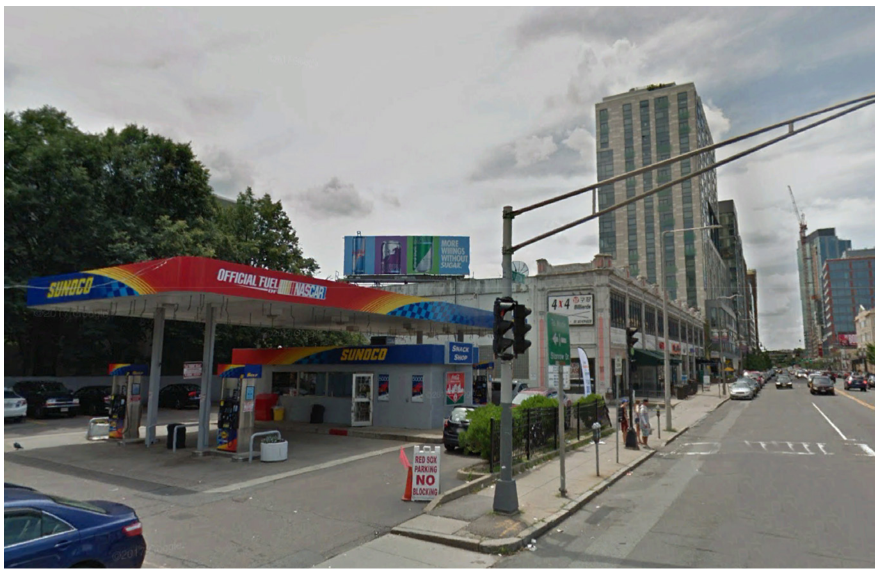
1252-1270 Boylston
Boston, Massachusetts

Boylston Street Looking Southeast

Source: Gensler

Figure 2.6b
Project Rendering
Looking Southeast

1252-1270 Boylston
Boston, Massachusetts



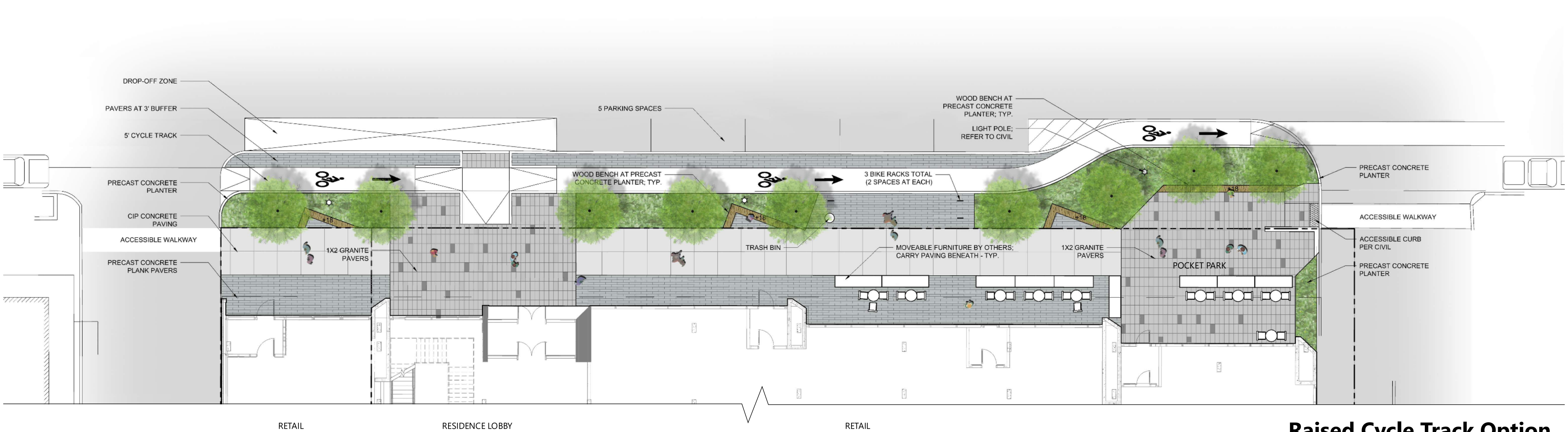
Existing Signage

Proposed Signage

Source: Gensler

Figure 2.7
Building Signage

1252-1270 Boylston
Boston, Massachusetts



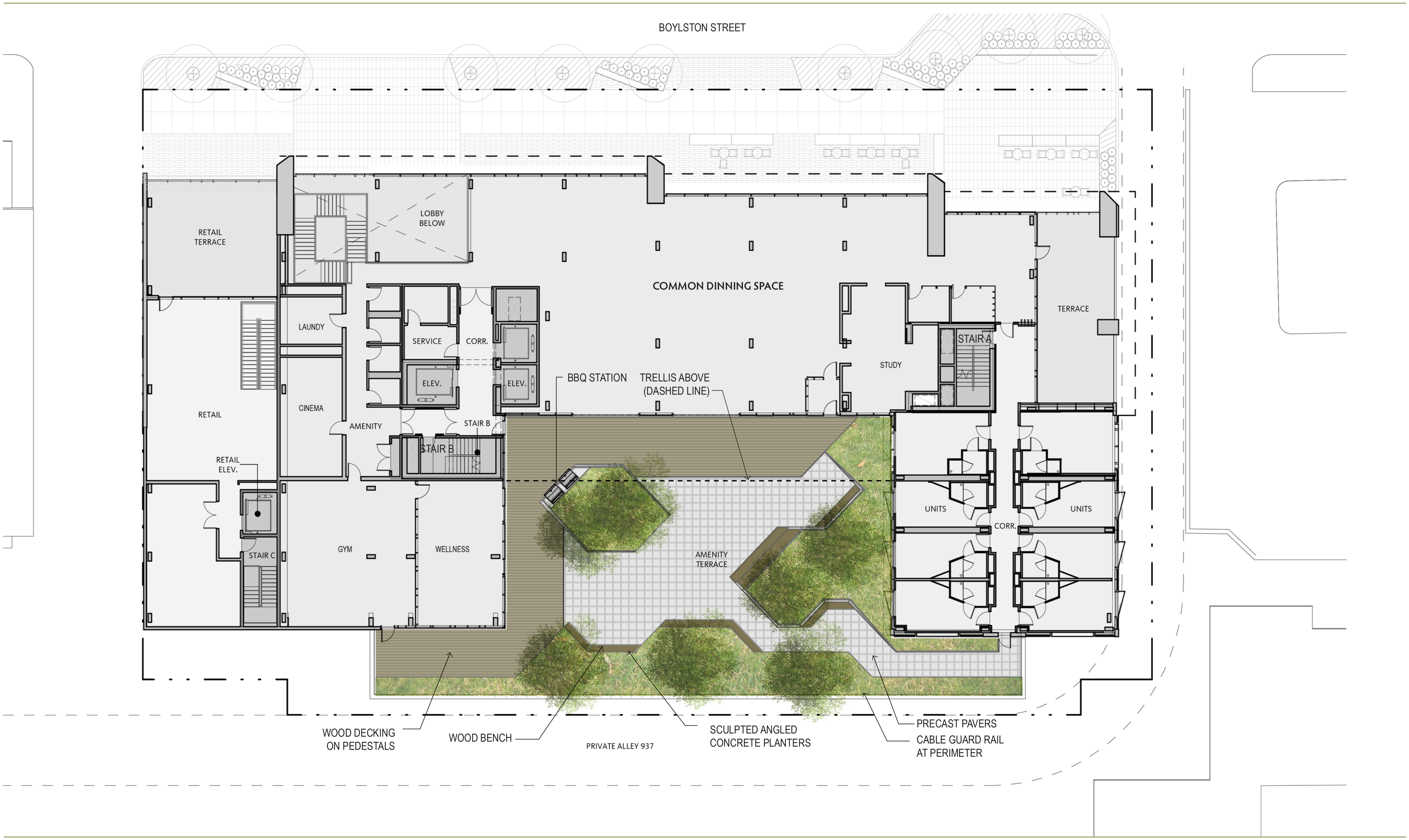
Raised Cycle Track Option

Source: Gensler

NOTE: The Project is in discussion with city agencies to determine best strategy for implementing a bike lane scheme that integrates with the urban fabric of the Boylston Street Corridor and the streetscape of the Project. Multiple designs have been presented and discussions with the city will progress throughout the design development phase.

Figure 2.8
Proposed Streetscape Improvement Plan

1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure 2.9
Proposed Amenity Terrace Plan
Level 2

1252-1270 Boylston
Boston, Massachusetts

3

Sustainability / Green Building and Climate Change Resiliency

This chapter describes the Project's overall approach to sustainable design, construction and operations. Included is a preliminary assessment of green building design, in compliance with the requirements of Article 37 of the Code pertaining to the City's Green Building policies and procedures ("Article 37"). Additionally, the Project achieves or exceeds the certifiable level per the U.S. Green Building Council's ("USGBC") Leadership in Energy and Environmental Design (LEED) version 4 ("v4") rating system.

This chapter also discusses the susceptibility of the Project Site to predicted climate change impacts, in accordance with the BPDA Climate Change Preparedness and Resiliency Policy ("Resiliency Policy"). The required Climate Change Preparedness and Resiliency Checklist ("Resiliency Checklist") has been completed for the Project and is provided in Appendix C.

3.1 Summary of Key Findings and Benefits

Key findings and benefits related to sustainability / green building design and climate change preparedness include the following:

- The Project Site is a reuse of a previously developed site in a dense urban setting, as opposed to an undeveloped open space.
- The Proponent will rejuvenate an underutilized site – which currently contains buildings that have exhausted their useful lives – by delivering a program comprised of purpose-built mixed-uses and an enhanced public realm, while thoughtfully connecting the Project Site to the Boylston Street corridor.
- The Project team will design the Project to be certifiable per the LEED v4 rating system, in compliance with Article 37 requirements.
  - The Project team is endeavoring to exceed minimum certifiable standards by targeting a minimum of certifiable level of LEED Silver.
- The Project will promote health and wellness for occupants through the incorporation of sustainable design elements. Design elements will include large windows to increase ambient lighting, indoor air quality measures, and consideration of WELL Building Standard ("WELL") principles with regards to programming and operations.
- The Project team will continue to evaluate additional measures to further conserve energy, water and infrastructure usage in an effort to exceed Massachusetts Stretch Energy Code requirements and ASHRAE 90.1-2013. Such measures will include LED

lighting within common areas and units, low-flush and low-consumption plumbing fixtures, and building energy management systems.

- Based on conceptual design, the Project is currently estimated to exceed minimum requirements for energy performance by reducing energy usage by 26% compared to the baseline of the Massachusetts Stretch Energy Code and reducing stationary source greenhouse gas (“GHG”) emissions by 16%.
- The Project team will evaluate alternative energy options, including cogeneration systems for recovery of energy and usage savings.
- The Project team will meet with representatives of local utility companies serving the Project Site and conduct early discussions regarding potential energy conservation measures and the utility incentives programs.
- The Project team has evidenced that, according to City sea level rise mapping, the Project Site is not located within a flood zone hazard area.

3.2 Regulatory Context

The following section provides an overview of the state and local regulatory context related to energy efficiency and GHG emissions.

3.2.1 Massachusetts Stretch Energy Code

As part of the Green Communities Act of 2008, Massachusetts developed an optional building code, known as the Stretch Energy Code, that gives cities and towns the ability to choose stronger energy performance in buildings than otherwise required under the Massachusetts State Building Code. Codified by the Board of Building Regulations and Standards as 780 CMR Appendix 115.AA of the 9th edition Massachusetts State Building Code, the Stretch Energy Code is an appendix, based on further amendments to the International Energy Conservation Code (IECC). The Stretch Energy Code increases the energy efficiency code requirements for new construction, major residential renovations, and additions in municipalities which adopt it. The Stretch Energy Code applies to new commercial buildings over 5,000 square feet and multifamily residential buildings over three stories. The City adopted and made mandatory the Stretch Energy Code on July 1, 2011.

Effective January 1, 2017, the IECC 2015 / ASHRAE 90.1-2013 standard became the updated state-wide energy code as an amendment to the 9th edition of the State Building Code, and the Stretch Energy Code was amended to require 10% greater energy efficiency compared to ASHRAE 90.1-2013 baseline. Given the adoption of the most recently revised Stretch Energy Code, the Project has incorporated these new requirements into its basis of design. Section 3.4.2 demonstrates how the Project meets the current Stretch Energy Code requirements.

3.2.2 Article 37 of Boston Zoning Code

Per Article 37, the City encourages major building projects to be ”planned, designed, constructed, and managed to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston." Any project that is subject to Article 80B Large Project Review is also subject to the requirements of Article 37. The Article 37 compliance documentation is reviewed by the Interagency Green Building Committee (IGBC).

Article 37 requires all projects over 50,000 square feet to meet LEED criteria and standards by either registering the project and achieving third-party verification by the IGBC or demonstrating that the project would meet the minimum requirements to achieve a LEED Certified level (i.e. all LEED pre-requisites and at least 40 points associated with credits listed on the LEED project checklist) without registering the project with the USGBC ("LEED certifiable"). With the LEED v4 rating system effective as of October 31, 2016, the BPDA requires initial Article 80B Large Project Review submissions on or after November 1, 2016 to demonstrate LEED certifiability using LEED v4. Section 3.3.1 below demonstrates how the Project complies with Article 37.

Boston Green Building Credits

Appendix A of Article 37 lists Boston Green Building Credits, which are credits that may be included in the calculation toward achieving a LEED certifiable project. These credits were developed by the City and are intended to address local issues unique to development in the City. The credits include Groundwater Recharge and Modern Mobility.

3.2.3 City of Boston Resilience Planning

Greenovate Boston is an initiative to get all Bostonians involved in implementing the City's Climate Action Plan, which outlines the ways in which the City will be carbon neutral by 2050 and how GHG will be reduced 25% by 2020. The initiative includes working with Boston University's Institute for Sustainable Energy and the Green Ribbon Commission to analyze the options to achieve carbon neutrality by 2050 across four sectors: buildings, energy, transportation and waste. The City is also in the process of updating the Climate Action Plan. Section 3.4.2 demonstrates how the Project team aims to support the goals of this plan by reducing overall energy usage and associated GHG emissions.

3.2.4 BPDA Climate Change Preparedness and Resiliency Policy

In conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the BPDA requires projects subject to Article 80B Large Project Review to complete a Resiliency Checklist to assess potential adverse impacts that might arise under future climate conditions, as well as any project resiliency, preparedness, and mitigation measures identified early in the design process. The Resiliency Checklist is reviewed by the IGBC. Section 3.5 demonstrates how the Project addresses this policy and Appendix C provides the completed Resiliency Checklist based on the current design.

3.3 Sustainability / Green Building Design Approach

The Proponent has identified sustainability as one of the design team's priorities for the Project. In support of the City's energy conservation and GHG emissions reduction goals, the Project team is working to provide an energy efficient building that elevates the standard for private academic accommodations. The sustainability goals for the Project include enhancing the neighborhood by reusing and improving a previously developed site, proactively incorporating energy efficient and sustainable design measures, minimizing and mitigating any potential adverse environmental impacts through thoughtful programming and design, and cultivating health and wellness for the building's occupants, employees, customers and neighbors. These goals will continue to guide critical decisions regarding design and operations for the Project.

Article 37 requires that the Project is LEED certifiable. The Project will be designed to exceed the minimum requirement by showing compliance using the LEED v4 New Construction rating system ("LEED-NC") to target a minimum certifiable level of LEED Silver (50 or more points). This is detailed in the draft LEED Scorecard in Figure 3.1.

The design team for the Project includes several LEED Accredited Professionals, including members from Gensler, VHB, and WSP. The Proponent and design team will continue to evaluate and incorporate sustainable design and energy conservation measures as the design process proceeds.

3.3.1 Compliance with Article 37

Location and Transportation

The Project team has identified 12 achievable points within the Location and Transportation Credit category along with three points that may be feasible pending additional investigation. The Project Site is located within the Fenway neighborhood, with access to a range of intermodal public transportation options. Additionally, its centralized location amongst various academic and medical institutions, employers and cultural attractions fosters walking and bicycling. Accordingly, the Project team sought to further align with sustainability objectives by limiting the onsite parking. Building occupants, employees and customers will be encouraged to utilize alternative means of transportation. Neighbors and pedestrians will have the opportunity to engage with – and participate in – a thoughtfully programmed public realm and an activated neighborhood-oriented retail setting.

The Project will provide 267 covered bicycle storage spaces, supplemented by in-unit bicycle storage equipment options and onsite exterior bicycle racks, further encouraging building occupants and the public to choose sustainable transportation alternatives. The Project team has met with the Boston Transportation Department (BTD) to review onsite bicycle storage and has received verbal approval for the proposed quantity.

Sustainable Sites

The Project team has identified five achievable points within the Sustainable Sites category. As a reuse of a previously developed site, the Project is ideal for reuse of existing utilities and public infrastructure surrounding the Project Site. The Project is designed to minimize rainwater runoff and reduce the impact of highly absorptive surfaces contributing to the urban heat island effect. The Project will also include a second-floor outdoor terrace, which will reduce contributions to the urban heat island effect and provide accessible open and green amenity space. The Project team has also identified five potential points which may be achievable, pending further investigation to determine feasibility. The Project team will continue to evaluate potential achievable credits related to the Project's rainwater management strategy, pedestrian oriented open space, and onsite habitat protection and restoration.

Water Efficiency

The Project team has identified six points that are attainable, along with an additional two points that may be feasible pending additional investigation. The Project is designed to incorporate low-flow and low-consumption plumbing fixtures to reduce indoor water consumption by approx. 30-35% compared to the baseline of the Massachusetts Stretch Energy Code. Also, advanced water meters will be installed to track water usage data for the building with the goal of realizing additional efficiencies. As building design advances, the Project team will continue to evaluate potential achievable credits related to additional water savings through the reduction of irrigation and indoor water use demands.

Energy and Atmosphere

The Project team has identified 12 points within the Energy and Atmosphere category that are attainable, and another 14 points that may be feasible with further investigation.

The 12 attainable credits in the Energy and Atmosphere category will be achieved through reductions in overall energy consumption and cost, enhanced commissioning strategies, green power and carbon offsets, and advanced metering of energy subsystems to help the Project monitor and reduce consumption. Based on early building energy modeling, the conceptual design demonstrates an energy cost reduction of 10% compared to ASHRAE 90.1–2010, as required by LEED v4, which equates to three achievable points.

The Project team will continue to evaluate potential measures to further improve energy performance, demand response, refrigerant management, and renewable energy production strategies.

The Project team is investigating the implementation of a combined heat and power ("CHP") system, which would further optimize energy efficiency onsite.

Materials and Resources

The Project team has identified four points that are attainable within the Materials and Resources category, and an additional three points as potential target credits. The Project will reduce the overall footprint of the materials and resources by utilizing sustainable waste management strategies and maximizing the declarations of environmental products and chemical ingredients of the permanently installed products. The Project team will continue to evaluate incremental points pertaining to Building Product Disclosure Optimization.

Indoor Environmental Quality

The Project team has identified six points in this category that are likely to be attainable for the Project, and eight points that may be feasible subject to further evaluation. Strategies such as enhanced indoor air quality and construction indoor air quality management plans, as well as a low-emitting materials plan are incorporated to provide a healthy indoor environment for all occupants, employees and customers.

In addition to achieving the identified LEED credits for Indoor Environmental Quality, the Project team will promote health and wellness through the incorporation of WELL principles in design and operations.

Innovation

All LEED v4 projects must pursue at least one pilot credit, one innovation credit, and no more than two exemplary performance credits. The innovation in design credits may include: designing a walkable Project Site to encourage visitors to walk, increasing health and environmental benefits, purchasing lamps that contain minimal-to-zero mercury to reduce toxic materials onsite, and having a LEED Accredited Professional on the Project team.

Regional Priority

The four points available in the Regional Priority category are contingent on the Project meeting certain thresholds for credits in previous categories as determined by the USGBC. The Project has identified the Regional Priority credit for Rainwater Management as attainable and two additional credits that may be feasible for the Project.

Boston Green Building Credits

Appendix A of Article 37 lists Boston Green Building Credits, which are credits that may be included in the calculation toward achieving a LEED v4 certifiable project. These credits, along with the prerequisites, were developed by the City and are intended to address local issues unique to development within the City. This system supplements a LEED certification and allows projects to comply with these unique credits that can then be included in the calculation towards achieving a LEED certification. The credits include the following categories: Modern Grid, Historic Preservation, Groundwater Recharge, and Modern Mobility.

The Project team will comply with the prerequisites and will investigate the Boston Green Building Credits.

3.4 Preliminary Energy Conservation / GHG Emissions Reduction Approach

In alignment with regional efforts to reduce GHG emissions and in support of Boston's specific GHG emissions reduction targets, the Project team will continue to evaluate energy efficiency measures ("EEMs") for possible inclusion in the Project. The EEMs will include low-flow and low-consumption plumbing fixtures, as well as high-efficiency mechanical and ventilation systems, which contribute to the building's 16% reduction in GHG emissions and 26% reduction in energy consumption. The Project team is aware of the City's goal of achieving a 25% reduction in GHG emissions by 2020 and will continue to investigate additional GHG reduction strategies, such a CHP, as the design progresses. Whole building energy modeling was used for a preliminary analysis of possible energy efficient measures.

3.4.1 Energy Conservation Approach

The energy savings calculated in the preliminary energy model were based on several key energy conservation measures for the Project that include:

- High-performance glazing with reduced window to wall ratio, including:
  - Reduced glazing percentages below 40%;
  - Better-than-code glazing U-factor below 0.40;
- Improved opaque exterior wall system with performance 20% better than code;
- High performance water-source heat pumps with EC motors;
- Energy recovery wheel with 70% effectiveness on ventilation air;
- Condensing hot water boiler with 96% efficiency;
- Condensing hot water heater with 95% efficiency;
- Low-flow and low-consuming domestic hot water fixtures;
- Low-lighting power density; and
- Major energy-using equipment installed correctly through the help of Commissioning.

As the design process advances, the Project team will evaluate further load reduction measures.

3.4.2 Energy Model Results

The Project meets the current Stretch Energy Code requirement to demonstrate a minimum 10% reduction in energy consumption compared to the base energy code requirements (ASHRAE 90.1-2013). As currently designed, the estimated energy usage for the building is reduced by approx. 26% compared to the baseline (as detailed below in Table 3-1). The energy consumption of the overall Project is expected to result in estimated GHG emissions of 1,004 tons per year, which represents an approx. 16% reduction from the baseline (demonstrated in Table 3-2). The high performance of the Project is proposed to be achieved through a combination of measures, including – but not limited to – high-efficiency heating and cooling systems, heat rejection system improvements, and improved lighting and envelope options. The energy consumption broken down by end use for the base code and the Project's design are demonstrated in Graph 3-1.

Table 3-1 Preliminary Energy Model Results

Energy Consumption			
	Electricity (MBtu)	**Natural Gas (MBtu)**	**Total (kBtu/sf)**
Base Case (ASHRAE 90.1-2013)	6,354	9,117	65.8
	41%	59%	
Design Case	7,403	3,987	48.4
	65%	35%	
Savings	-1,049	5,130	17.4
Savings Target	-	-	10%
Percent Savings	-17%	56%	**26%**

Graph 3-1 Energy Model End-Use

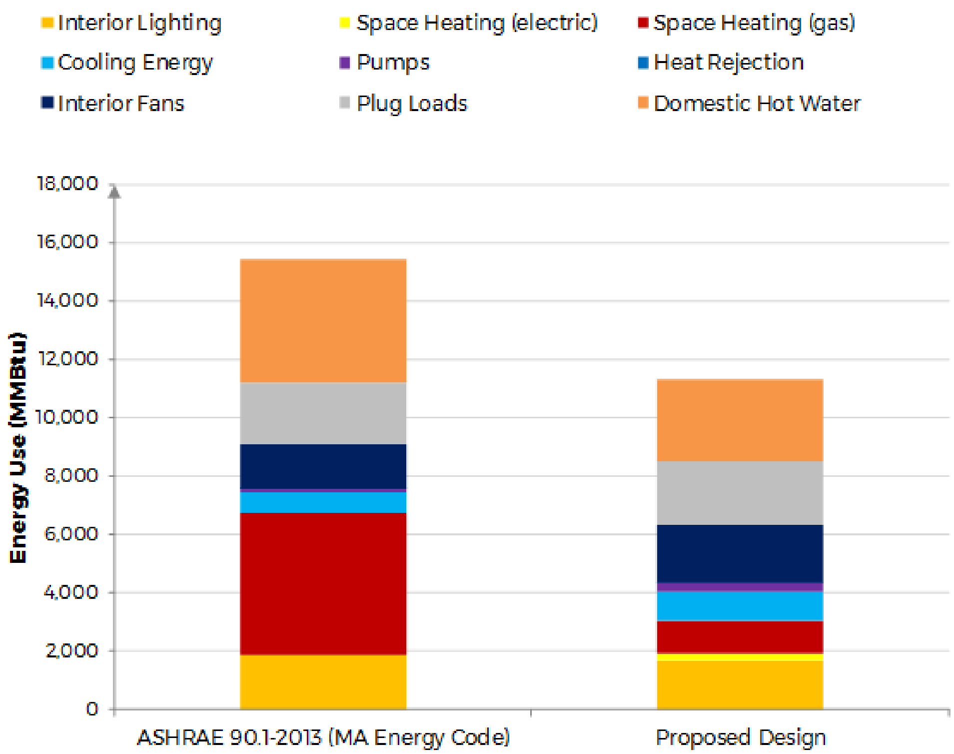


Table 3-2 Preliminary GHG Emissions Reductions

	Greenhouse Gas (CO_2) Emissions		
	Electricity (short tons)	**Natural Gas (short tons)**	**Total (short tons)**
Base Case (ASHRAE 90.1-2013)	661	535	1,196
	55%	45%	
Design Case	770	234	1,004
	77%	23%	
Savings	-109	301	192
Percent Savings	-16.5%	56.3%	**16%**

3.4.3 Preliminary Evaluation of Onsite Renewable Energy

Combined Heat and Power (CHP)

CHP is the simultaneous production of electricity with the recovery and utilization of heat. Fuel (e.g. natural gas) is used to generate electricity at a facility and a portion of the waste heat from the power generation is then used to provide useful thermal energy.

CHP systems are most efficient when there is a hot water demand year-round, making it applicable for residential projects. The Project team will continue to explore the benefits of implementing CHP for the building for use in heating domestic hot water and providing power. As design advances, the Project team will continue to assess the viability of including small scale CHP systems for the Project.

The initial study will investigate a modular CHP system with the following characteristics:

- System Size: 75 kW
- Natural Gas Input: 919,800 Btu/hr
- Hot Water Output: 486,000 Btu/hr

The Project team will first reach out to Eversource to determine interconnection requirements at the Project Site location.

Solar Photovoltaic (PV) Systems

An evaluation of incorporating a roof-mounted solar PV system has been conducted for the Project. The preliminary analysis indicates that maximum 31 kW solar PV array could be installed on the building rooftop. The system would generate an estimated 37,100 kWh per year of electricity, which results in an annual energy cost savings of approx. $5,900. The installed cost of the system would be approx. $109,200, resulting in a long payback of 11 years (after state incentives and without federal tax credits considered).

The PV system would offset up to 1% of the overall energy consumption of the building, generating a minimal effect on the whole-building energy usage. As a result, the Proponent will focus on other energy efficiency strategies, such as CHP and building envelope improvements. At a minimum, the Project will be designed to be solar-ready.

3.4.4 Early Utility Outreach

The Project team will meet with representatives of local utility companies serving the area to discuss the utility incentives programs available. By working with these utility companies throughout the design process, the Proponent will evaluate additional energy conservation and cost savings strategies, as well as associated GHG emissions reductions that may be feasible. The Project will participate in the MassSave New Construction Program, which is designed to target energy efficient opportunities in new, commercial / residential applications. The program provides financial incentives and technical assistance to developers, customers, and design professionals to encourage the use of design features and equipment that may optimize energy efficiency in new construction projects.

3.5 Climate Change Preparedness and Resiliency

This section discusses the proposed design approach to preparing for anticipated changes in the climate, in accordance with the BPDA Climate Change Preparedness and Resiliency Policy. The required Resiliency Checklist has been completed for the Project and is provided in Appendix C.

3.5.1 Sea Level Rise and Extreme Flooding

According to the City sea level rise mapping, the Project Site is not located within a flood hazard area and, therefore, not at high risk of inundation from sea level rise during its design life (approx. 50 years, based on the industry standard). This section describes the climate change vulnerability evaluation of the Project Site.

Climate Change Studies / Projections Considered

New England is expected to experience greater localized sea level rise due to climate change. There are many sources which have quantified the expected sea level rise and evaluated the various scenarios in the context of the City. The Massachusetts Office of Coastal Zone Management (CZM) has prepared the document *Sea Level Rise: Understand and Applying Trends and Future Scenarios for Analysis and Planning*, which provides projections of expected sea level rise for Boston at several points in the future under different GHG emission scenarios: Lowest, Intermediate Low, Intermediate High, and Highest.

The CZM document gives planners and designers a resource for 'bathtub' model evaluations of assets and infrastructure. These evaluations can be added to flood elevations provided by resources, such as the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) program. These maps provide the 1- and 0.2% annual exceedance probability flood event (i.e. 100-year and 500-year floodplain elevations along U.S. waterways and coasts). These maps, when combined with sea level rise, can provide a basic flood elevation (BFE) evaluation tool.

Massachusetts Department of Transportation ("MassDOT") and the Federal Highway Administration (FHWA) have taken the CZM sea level rise information one step further than the 'bathtub' model, by creating a dynamic flooding model. The MassDOT-FHWA, *Pilot Project Report: Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options for the Central Artery,* provides flood elevations generated by a hydrodynamic model coupled with a wave simulation model, over the topography and bathymetry of the Greater Boston area. This model provides the most widely-accepted, site-specific flooding model for sea level rise in the City, to demonstrate the risk for certain planning years based on GHG emission scenarios.

Project Site Vulnerability Evaluation

The Project Site is not located within the FEMA map 100-year floodplain (Zone AE), as demonstrated on Figure 3.2 (the FEMA Flood Map Panel 25025C0076G, dated September 25, 2009; MassGIS FEMA National Flood Hazard Layer July 2017). The nearest BFE for predicted Sea Level Rise is located in the Back Bay Fens, at the Muddy River. The BFE at this location is 12.8 feet Boston City Base (BCB).

Figures 3.3a and 3.3b demonstrate the 2030 and 2070 inundation probabilities from the high emissions scenario of the flood risk model developed by the Woods Hole Group and commissioned by MassDOT. These figures demonstrate that there will be no flooding due to sea level rise in 2030 at or near the Project Site. In 2070, the projections evidence negligible risk to the Project Site. Furthermore, the Climate Ready Boston report, released in December 2016, indicated no change in Sea Level Rise projections within the Fenway neighborhood.

3.5.2 Extreme Weather Events / Temperature

This section examines how the Project may be affected by – and will prepare for – climate change-induced extreme weather events.

The 2011 Massachusetts Climate Change Adaptation Report projects an increase in extreme weather events which could consist of droughts, floods, increased precipitation, extreme heat and cold stretches, increased number of days with extreme heat (i.e. temperatures greater than 90°F), increased winter precipitation – mostly in the form of rain – and fewer snow events.

To understand the potential impacts of extreme weather conditions, the Project team will use Whole Building Energy Simulation to analyze the performance of heating and cooling equipment under extreme cold (0ºF) and heat events (100ºF). The Project team will assess occupant thermal comfort under extreme conditions lasting up to three consecutive days, including in the event of a power outage or a loss of heating and cooling capacity.

The Climate Change Preparedness and Resiliency Checklist in Appendix C will demonstrate how the Project will respond to extreme weather conditions.

3.5.3 Potential Resiliency Measures

The Project will incorporate roofing and paving materials with high Solar Reflectance Index (SRI) values aimed at reducing urban heat island effect during extreme heat events. In the case of an extreme rain event, the stormwater conveyance infrastructure has been designed to minimize runoff and sustainably infiltrate stormwater onsite. As the design process advances, the Project team will continue to evaluate potential incremental measures to further mitigate the effects of climate change.

Site Design

The Project will provide infiltration of stormwater runoff to help alleviate capacity in Boston Water and Sewer Commission (BWSC) systems in Boylston Street. The infiltration systems will be sized according to the BPDA Smart Utilities Policy and BWSC regulations.

Building Design

The Project's Finished Floor Elevation will be well-protected from flooding as it is currently located approx. seven feet above the nearest FEMA floodplain, at the nearby Muddy River, and is not within the BPDA mapped area for predicted Sea Level Rise. Furthermore, all critical building equipment will be protected from flooding. The critical equipment in the electrical room in the basement of the building along Private Alley 937 will be located at a minimum elevation of 13.0 feet, which is above the nearby Muddy River flooding elevations established by FEMA and the BPDA.

Employing reflective roof materials and vegetated roofs will be considered, in order to mitigate rising temperature impacts.

As part of the energy modeling process, historic climate history that reflects the predicted increase in temperature may be used to better understand how the buildings and their systems would perform under different climate conditions. This understanding will be considered when designing major plant and overall Heating, Ventilation, and Air Conditioning (HVAC) systems.

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

Project Checklist

Y	?	N	Type	Credit	Points
	1		Credit	Integrative Process	1
12	**3**	**1**		**Location and Transportation**	**16**
			Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
	2		Credit	High Priority Site	2
5			Credit	Surrounding Density and Diverse Uses	5
5			Credit	Access to Quality Transit	5
	1		Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
		1	Credit	Green Vehicles	1
5	**5**	**0**		**Sustainable Sites**	**10**
Y			Prereq	Construction Activity Pollution Prevention	Required
	1		Credit	Site Assessment	1
	2		Credit	Site Development - Protect or Restore Habitat	2
	1		Credit	Open Space	1
2	1		Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
1			Credit	Light Pollution Reduction	1
6	**2**	**3**		**Water Efficiency**	**11**
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
1	1		Credit	Outdoor Water Use Reduction	2
2	1	3	Credit	Indoor Water Use Reduction	6
2			Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1
12	**14**	**7**		**Energy and Atmosphere**	**33**
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
6			Credit	Enhanced Commissioning	6
3	9	6	Credit	Optimize Energy Performance	18
1			Credit	Advanced Energy Metering	1
	2		Credit	Demand Response	2
	2	1	Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

Y	?	N	Type	Credit	Points
4	**3**	**6**		**Materials and Resources**	**13**
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
		5	Credit	Building Life-Cycle Impact Reduction	5
1	1		Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
	1	1	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
1	1		Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2
6	**8**	**2**		**Indoor Environmental Quality**	**16**
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1	1		Credit	Enhanced Indoor Air Quality Strategies	2
2	1		Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
		2	Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1	1		Credit	Interior Lighting	2
	3		Credit	Daylight	3
	1		Credit	Quality Views	1
	1		Credit	Acoustic Performance	1
4	**2**	**0**		**Innovation**	**6**
3	2		Credit	Innovation	5
1			Credit	LEED Accredited Professional	1
1	**2**	**1**		**Regional Priority**	**4**
	1		Credit	Optimize Energy Performance (8 point threshold)	1
	1		Credit	High Priority Site	1
1			Credit	Rainwater Management (2 point threshold)	1
		1	Credit	Building Lifecycle Impact Reduction (2 point threshold)	1
50	**40**	**20**		**TOTALS** Possible Points:	**110**

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

Source: WSP

Figure 3.1

Draft LEED Scorecard

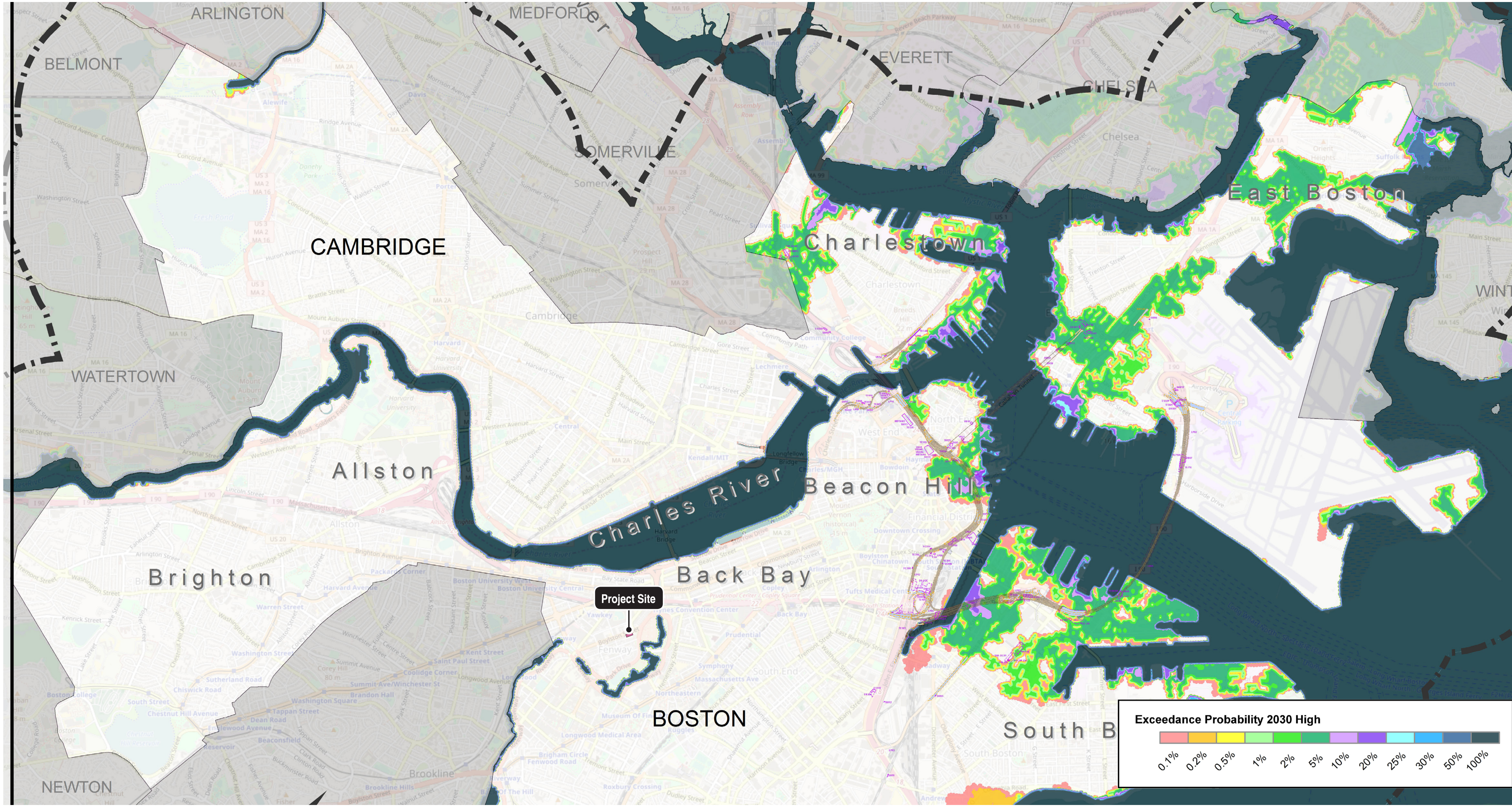
Source: MassGIS FEMA National Flood Hazard Layer July, 2017

Reference: FEMA Flood Map Panel 25025C0076G, September 25, 2009

Figure 3.2

Effective FEMA 100-Year Floodplain

1252-1270 Boylston Street
Boston, Massachusetts

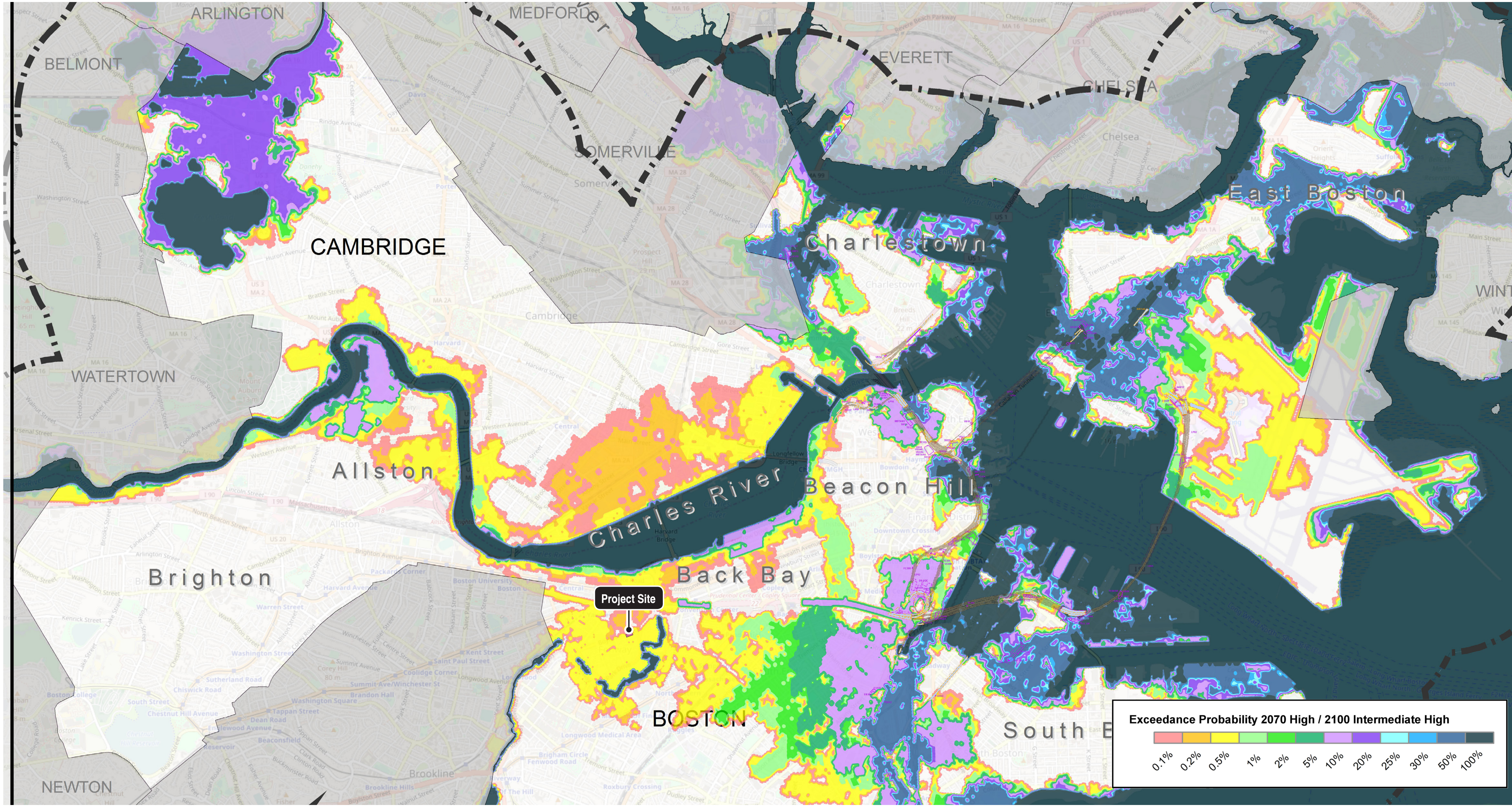


Source: MassDOT, Woods Hole Group

Figure 3.3a

2030 Coastal Flood Exceedance Probabilities (High Scenario)

1252-1270 Boylston Street
Boston, Massachusetts



Source: MassDOT, Woods Hole Group

Figure 3.3b

2070 Coastal Flood Exceedance Probabilities (High Scenario)

1252-1270 Boylston Street
Boston, Massachusetts

4

Transportation

This chapter provides a comprehensive evaluation of the existing and proposed transportation conditions in the study area. The detailed analysis captures the design, construction, and operational characteristics of the Project, and provides a basis for determining to what extent, if any, Project-related transportation demands are likely to affect the wider transportation network. The analysis provides evidence that transportation impacts are minimal due to the nature of the Proponent's commitment to zero net-new parking spaces and alternative means to vehicular transportation.

This study has been developed to conform with the BTD "Transportation Access Plans Guidelines" and uses standard methodologies, including the Institute of Transportation Engineers' ("ITE") *Trip Generation Manual*, 10th Edition, and local travel characteristics as defined in *Access Boston 2000-2010*. The study analyzes the following as part of the evaluation of 2018 Existing Conditions:

- Vehicle traffic on study area roadways and intersections;
- Vehicular level of service (LOS) analysis;
- Parking conditions;
- Loading and service activities;
- Pedestrian and bicycle operations; and
- Public transportation services.

In addition, this study quantifies and assesses the transportation impacts that are anticipated under future conditions. Collectively, the purpose of this analysis is to:

- Define and quantify existing transportation conditions in the Project study area;
- Estimate the transportation impacts that will be generated under future conditions based on the anticipated program for the Project; and
- Develop a set of mitigation strategies and improvement measures which will help lessen the transportation effects of the Project.

The sections below provide an overview of the Project and a summary of findings for the transportation analysis, including existing and future conditions anticipated both with and without the Project, as well as any anticipated impacts and proposed mitigations.

4.1 Summary of Key Findings and Benefits

The Project is designed to have minimal impacts on the area's peak period traffic operations. The results of the analysis indicate that there will be no changes in LOS in the study area from Project-related traffic and only nominal increases in delay at specific intersections within the study area at peak periods throughout the day. The Project will also implement a proactive Transportation Demand Management (TDM) program and other site amenities to encourage use of alternative transportation modes.

The following are key findings and benefits related to transportation in connection with the Project:

- The Project Site is located within the Fenway neighborhood, offering a range of intermodal public transportation options and alternative vehicle uses, such as walking and bicycling.
- Traffic generated by the Project will generate no measurable impacts to the surrounding transportation network.
  - In total, the Project is projected to generate only six net-new vehicle trips during the weekday morning peak hour and 14 net-new vehicle trips during the weekday evening peak hour (demonstrated in Table 4-8).
  - All retail loading service will remain on the rear side of the Project Site, while all resident move-ins will be coordinated and scheduled at specific drop-off times at the front of the Project Site. As all units will be fully-furnished and turnkey, the Project will eliminate the need for large moving vehicles and loading dock accommodations.
  - No net-new parking will be constructed in connection with the Project, which will not only support the need for alternative modes of transportation but will also minimize construction duration and neighborhood impacts. The Project anticipates maintaining the 15 parking spaces that are currently provided onsite. These spaces will be relocated in the basement level with access via Private Alley 937.
- The Project improves the existing conditions by delivering a program comprised of purpose-built mixed-uses and an enhanced public realm, while thoughtfully connecting the Project Site to the Boylston Street corridor.
  - The Project will provide sidewalk improvements along Boylston Street that are consistent with recent projects along the Boylston Street corridor, including activated, neighborhood-oriented, ground-floor retail and outdoor seating, along with complementary street lighting, landscaping, and waste disposal.
  - Additionally, a new bike lane, drop-off curb cut, and public benches will be included in the public realm design, in order to complete the public realm along Boylston Street. All improvements will be in accordance with City guidelines and neighborhood standards.
  - Transparency of the street-level experience, through the design of glass storefronts, proper street lighting, and upgraded, wide sidewalks will enhance the safety and atmosphere of the Project Site.
  - New sidewalks and ramps will conform to Americans with Disabilities Act and Architectural Access Board (ADA / AAB) standards.

    - The new bike lane will be designed to the City's Complete Streets standards and take into consideration safety precautions associated with on-street traffic and parking, as well as vehicular drop-offs and pick-ups.
- The Project will provide 267 covered bicycle storage spaces, supplemented by in-unit bicycle storage equipment options and onsite exterior bicycle racks.
- The indoor bicycle storage room will be easily accessible, located on level B1 of the building, immediately off the main elevator lobby.
- The Project will also include public, outdoor bicycle racks to support ground-floor retail space visitors and the general public.
- The Project will implement a proactive TDM Plan with specific measures to promote and encourage residents and visitors to use sustainable transportation modes.
    - All residents will be introduced to the ridesharing and carpool options available within proximity to the Project.
    - Retail and / or restaurant tenants will be encouraged to provide an Emergency Ride Home program, similar to MassRides.

4.2 Project Description

The Project consists of approx. 235,095 square feet of mixed-use programming, comprised of 533 professionally-managed academic accommodations and an activated, permeable, ground-floor retail podium designed for a broad range of neighborhood-oriented culinary, lifestyle, and experiential tenants.

The Project anticipates maintaining and relocating the 15 parking spaces that are currently provided onsite, as well as five of the existing on-street metered parking spaces along Boylston Street. Retail loading and service activities will remain along the rear side of the building with access via Boylston Street but will be improved upon, as demonstrated in Section 4.5.2.

Table 4-1 Project Development Program

Land Use	Existing	Proposed	Difference
Residential	0 units (0 SF)	533 units or; (190,000 SF)	+533 units or; (+190,000 SF)
Retail	0 SF	16,325 SF	+16,325 SF
Supplemental / Support	29,000 SF	28,770 SF	-230 SF
Office	24,000 SF	0 SF	-24,000 SF
Parking	15 spaces	15 spaces	0 spaces
Bicycle Parking Secured / Covered Spaces Outdoor Spaces	-- --	267 6-10	+267 +6-10

4.2.1 Site Access and Circulation

The Project will be accessed by both residents and retail visitors at entrances along Boylston Street. The Boylston Street frontage will continue to provide on-street, metered parking, while the Project sidewalk improvements will include a newly designated drop-off area for ridesharing opportunities. The Project will allow for a completely enhanced site access experience, due to improvements such as new bicycle racks, wide sidewalks, a drop-off curb cut, and public benches. Collectively, these improvements will support various methods of transportation when accessing the Project and will effectively connect the Project Site to the Boylston Street corridor.

The streetscape and hardscape will be well-lit and offer attractive landscaping and amenities that are consistent in design specifications as those along the Boylston Street corridor west of the Project Site. Transparency of the street-level experience, through the design of glass storefronts, proper street lighting, and upgraded, wide sidewalks will enhance the safety and atmosphere of the block, as pedestrians freely enter and exit the site for shopping, eating, and relaxing. Additionally, it is anticipated that the various neighborhood-oriented retail and restaurant uses will offer outdoor seating, providing multi-seasonal activation and use for the public.

Retail loading and trash service will be maintained along Private Alley 937, as it currently exists today. Loading and service activities will not be permitted to occur along Boylston Street. Figure 4.1 demonstrates the location of pedestrian access doors, loading dock, trash room, and bicycle storage.

4.3 Study Methodology

The analysis presented in this chapter provides a detailed description of the Project's transportation characteristics and evaluates key impacts to the transportation infrastructure. The transportation analysis presented in this chapter conforms to the BTD Guidelines.

The transportation analysis includes the projection of Project-related trips based on the ITE *Trip Generation Manual*, 10th Edition, and the application of local travel characteristics established through the *Access Boston 2000-2010* initiative. Synchro 9 software was used to facilitate the evaluation of traffic operations based on the Highway Capacity Manual (HCM) methodologies.

4.3.1 Traffic Study Area

Based on the Project program and the surrounding vehicular network, eight study intersections were determined. As demonstrated in Figure 4.2, the following intersections were included in the study area for the analysis:

- Boylston Street at Brookline Avenue / Park Drive (West) (signalized)
- Boylston Street at Kilmarnock Street (signalized)
- Boylston Street at Jersey Street (signalized)
- Jersey Street at Van Ness Street (unsignalized)
- Brookline Avenue at Jersey Street / David Ortiz Drive (unsignalized)
- Boylston Street at Ipswich Street (signalized)
- Boylston Street at Park Drive (East) (signalized)
- Gaston Square - Boylston Street at Charlesgate (signalized)

4.3.2 Analysis Conditions

The transportation analysis considers the following analysis scenarios:

- **2018 Existing Condition** - Recent traffic data conducted within the study area in May 2018.
- **2023 No-Build Condition** - Future conditions for the five-year time horizon that are expected to occur if the Project was not constructed.
- **2023 Build Condition** - Future conditions for a five-year time horizon assuming construction and full occupancy of the Project.

4.4 2018 Existing Condition

This section describes existing transportation conditions, including:

- An overview of roadway conditions;
- Transit, pedestrian, and bicycle facilities; and
- General site conditions.

4.4.1 Roadways

The Project Site is located along Boylston Street, surrounded by Private Alley 937 to the east and south, and existing buildings to the west.

- **Boylston Street**

  Boylston Street is north of the Project Site and provides two westbound travel lanes, two eastbound travel lanes, and two parking lanes (one on each side). Boylston Street runs from Boston Common to the east to Park Drive to the west. The north and south sides of Boylston Street provide metered parking. Sidewalks are provided along both sides of the street and crosswalks are provided at intersections.

- **Brookline Avenue**

  Brookline Avenue is north of the Project Site and provides one southwest bound travel lane, one northeast bound travel lane, and two parking lanes (one on each side). Brookline Avenue runs from Washington Street to the southwest to Kenmore Square to the northeast. The north and south sides of Boylston Street provide metered parking. Sidewalks are provided along both sides of the street and crosswalks are provided at intersections.

- **Park Drive**

  Park Drive wraps around the southern portion of the study area as it separates the Fenway neighborhood from the Back Bay Fens Park (the "Fens"). The roadway is one-way and provides two lanes in the westbound direction that extends from Boylston Street to the northeast to Mountfort Street to the northwest. There is also a carriage road that runs parallel to Park Drive just to the north. The carriage road provides a single lane of one-way travel in the westbound direction that extends from Peterborough Street in the northeast to where it merges with Park Drive just west of the Kilmarnock Street intersection. Resident permit parking is provided on the north and south sides of the carriage road and on the east side of Park Drive, after the Park Drive carriage road merge. Sidewalks are provided along the north side of the carriage road and the south side of Park Drive (along the Fens). Crosswalks are provided at intersection and midblock crossing locations.

- **Kilmarnock Street**

  Kilmarnock Street is located west of the Project Site. The roadway provides two-way travel between Park Drive to the south and Brookline Avenue to the north. The east and west sides of Kilmarnock Street provide resident permit parking. Sidewalks are provided along both sides of the street and crosswalks are provided for crossings.

- **Jersey Street**

  Jersey Street is located west of the Project Site and provides a one-way northbound travel between Boylston Street to the south and Brookline Avenue to the north, and two-way travel between Park Drive to the south and Boylston Street to the north. Both sides of Jersey Street provide resident permit to the south and 2-hour parking to the north on typical days in the city. On days when an event is occurring at Fenway Park, restrictions may be in place on Jersey Street with respect to parking and vehicular through traffic. Sidewalks are provided along both sides of the street and all intersections provide crosswalks.

- **Van Ness Street**

  Van Ness Street is located north of the Project Site and provides two-way travel between Kilmarnock Street to the west and Richard B. Ross Way to the east, one-way westbound travel between Richard B. Ross Way to the east and Jersey Street to the west, and two-way travel between Jersey Street to the west and Ipswich Street to the east. Both sides of Van Ness Street provide metered parking to the west of Jersey Street on typical days in the City. On days when an event is occurring at Fenway Park, restrictions may be in place on Van Ness Street with respect to parking and vehicular through traffic. Sidewalks are provided along both sides of the street and all intersections provide crosswalks.

- **David Ortiz Drive**

  David Ortiz Drive is located northwest of the Project Site and provides one-way northwest bound travel between Brookline Avenue to the south and Overland Street / Maitland Street in the west. David Ortiz Drive abuts Yawkey Station on the north. No parking is provided on David Ortiz Drive, but curb space is provided for pick-ups and drop-offs. Sidewalks are provided along both sides of the street and all intersections provide crosswalks as well as a mid-block crossing to provide connection between adjacent parking and Yawkey Station.

- **Ipswich Street**

  Ipswich Street is located east of the Project Site and provides two-way travel between Boylston Street to the south and Van Ness Street to the north. Ipswich Street abuts both Fenway Park on the east and Interstate 90 on the south bypassing Gaston Square by passing underneath Charlesgate. Both sides of Ipswich Street provide metered parking. Sidewalks are provided along both sides of the street and all intersections provide crosswalks.

- **Charlesgate**

  Charlesgate is north of the Project Site and provides two northbound travel lanes and two southbound travel lanes. Charlesgate connects Boylston Street to the south to Storrow Drive to the north by travelling over Interstate 90. Only resident parking is provided on Charlesgate. Sidewalks are provided along both sides of the street and all intersections provide crosswalks.

4.4.2 Study Area Intersections

The study area consists of eight study intersections previously demonstrated in Figure 4.2 and described below. Traffic operations and LOS analysis are presented later in this chapter.

- **Boylston Street at Brookline Avenue / Park Drive (West) (signalized)**

  Boylston Street at Brookline Avenue and Park Drive is a five-legged, signalized intersection. Boylston Street is a two-way roadway that provides two eastbound lanes, two westbound lanes, and two parking lanes that terminate at the intersection. Brookline Avenue is a two-way roadway that provides two lanes approaching from the north and a right turn pocket and four lanes approaching from the south (a left-turn lane, a through lane, and two right-turn lanes onto Boylston Street). Park Drive is a one-way roadway that provides four lanes approaching from the south. Sidewalks are provided on all curbsides in this intersection. Crosswalks are provided across all legs of the intersection (with the exception of the receiving leg of Park Drive) and pedestrians are accommodated within the intersection’s signalization via concurrent pedestrian phases.

- **Boylston Street at Kilmarnock Street (signalized)**

  Boylston Street at Kilmarnock Street is a four-legged, signalized intersection. Boylston Street is a two-way roadway and provides two eastbound lanes, two westbound lanes, and two parking lanes. Kilmarnock Street is a two-way roadway that provides two lanes approaching from the north (one through / right turn and one left turn only) and a single shared lane approaching from the south along with two parking lanes on the southern approach. Sidewalks are provided on all curbsides in this intersection. Crosswalks are provided across all legs of the intersection and pedestrians are accommodated within the intersection’s signalization via concurrent pedestrian phases.

- **Boylston Street at Jersey Street (signalized)**

  Boylston Street at Jersey Street is a four-legged, signalized intersection. Boylston Street is a two-way roadway that provides two eastbound lanes, two westbound lanes, and two parking lanes on either side. Jersey Street is a two-way roadway that is the southern leg of this intersection. Jersey Street has one lane in either direction. Jersey Street is a one-way roadway that begins at the northern leg of this intersection. Bluebikes bicycle parking is available on the east side of Jersey Street and metered parking is available on the west side of Jersey Street. Sidewalks are provided on all curbsides in this intersection. Crosswalks are provided across all legs of the intersection and pedestrians are accommodated within the intersection’s signalization via concurrent pedestrian phases.

- **Jersey Street at Van Ness Street (unsignalized)**

  Jersey Street at Van Ness Street is a four-legged, unsignalized intersection. Jersey Street is a one-way northbound roadway that provides one lane with parking lanes provided on both the east and west sides. Van Ness Street is a two-way roadway providing a single lane in both the eastbound and west bound direction with parking on either side on the east approach. The west leg of Van Ness Street is a single receiving lane with parking on each side. Sidewalks are provided on all curbsides in this intersection. Crosswalks are provided across all legs of the intersection.

- **Brookline Avenue at Jersey Street / David Ortiz Drive (unsignalized)**

  Brookline Ave at Jersey Street / David Ortiz Drive is a four-legged, unsignalized intersection. Brookline Ave is a two-way roadway providing one travel lane in the westbound direction and one in the eastbound direction with parking on either side. Jersey Street is a one-way northbound roadway that provides one lane with parking lanes provided on both the east and west sides. David Ortiz Drive is a one-way roadway providing a single lane in the northbound direction with no parking provided. Sidewalks are provided on all curbsides in this intersection. Crosswalks are provided across the north, west, and south legs of the intersection.

- **Boylston Street at Ipswich Street (signalized)**

  Boylston Street at Ipswich Street is a three-legged, signalized intersection. Boylston Street is a two-way roadway that provides two eastbound lanes, two westbound lanes, and two parking lanes, one on each side. Ipswich Street is a two-way roadway that is the northern leg of this intersection and has one lane in either direction. Parking is not provided on Ipswich Street in close proximity to the intersection. Sidewalks are provided on all curbsides in this intersection. Crosswalks are provided across all legs of the intersection and pedestrians are accommodated within the intersection's signalization via concurrent pedestrian phases.

- **Boylston Street at Park Drive (East) (signalized)**

  Boylston Street at Park Drive is a three-legged, signalized intersection. Boylston Street is a two-way roadway that provides two eastbound lanes and two westbound lanes. Parking is not provided on this portion of Boylston Street. Along Boylston Street between Park Drive and Charlesgate, there is a parallel one-way southbound carriage road with a single travel lane with parking provided on either side. The carriage road is not controlled by the signal and is instead stop controlled. On the south leg of the intersection, Park Drive provides one-way southbound two-lane travel with no parking provided. Sidewalks are provided on all curbsides in this intersection. Crosswalks are provided across all legs of the intersection and pedestrians are accommodated within the intersection's signalization via concurrent pedestrian phases.

- **Gaston Square - Boylston Street at Charlesgate (signalized)**

  Boylston Street at Charlesgate is a three-legged, signalized intersection. Boylston Street is a two-way roadway that provides two eastbound lanes and two westbound lanes. Parking is not provided on this portion of Boylston Street. On the north leg of the intersection, Charlesgate provides two northbound travel lanes and two southbound travel lanes. Sidewalks are provided on all curbsides in this intersection, though sidewalks do not continue as Charlesgate travels over Interstate 90 approx. 300 feet north of the intersection. Crosswalks are provided across all legs of the intersection and pedestrians are accommodated within the intersection's signalization via concurrent pedestrian phases.

4.4.3 Data Collection

To assess the traffic conditions of the surrounding street network, manual turning movement counts ("TMCs") were collected at the study area intersections. TMCs were conducted on Wednesday, May 9, 2018. The data was collected in late 2018 during a typical weekday morning peak commuter period (7:00 AM - 9:00 AM) and evening peak commuter period (4:00 PM - 6:00 PM). Data was collected on a day when the Boston Red Sox did not have a game scheduled at Fenway Park to reflect typical weekday commuter period traffic operations. The TMCs are provided in Appendix D.

The TMCs were used to establish the study area network peak hour volumes for the 2018 Existing Condition analysis. The weekday morning peak hour was determined to be 7:30 AM to 8:30 AM and the weekday evening peak hour from 4:30 PM to 5:30 PM. The existing morning and evening peak hour volumes are demonstrated in Figures 4.3 and 4.4, respectively.

4.4.4 Pedestrian Environment and Accessibility

The study area has adequate pedestrian accommodations with sidewalks along the surrounding roadways and crosswalks provided at the intersections. Pedestrian volumes at the study area intersections were collected in conjunction with the TMCs collected on May 9, 2018. Figures 4.5 and 4.6 demonstrate the 2018 Existing Condition peak period pedestrian volumes. Adjacent to the Project site, there are 566 and 1,088 pedestrians crossing the Boylston Street at Jersey Street intersection during the morning and evening peak hours, respectively. At the intersection of Boylston Street and Ipswich Street, there are 244 and 516 pedestrians crossing during the morning and evening peak hours, respectively.

4.4.5 Bicycles

Bicycle volumes at the study area intersections, demonstrated in Figures 4.7 and 4.8, were collected simultaneously with the vehicle TMCs. Within the immediate study area, there are shared bicycle lanes along David Ortiz Drive. In addition, the Emerald Necklace / Back Bay Fens, located to the south of the Project Site, provides public recreational space, including paths for bicyclists and pedestrians. At the intersection of Boylston Street at Jersey Street, there are 24 cyclists that cross the intersection during the morning peak hour, and 28 cyclists cross the intersection during the evening peak hour.

The closest Bluebikes Station is at Boylston Street at Jersey Street (in front of the Viridian) and located less than 500 feet west of the Project Site, as demonstrated in Figure 4.9. The station provides 14 bicycle docks. In addition, there is a Bluebikes Station at the northwest corner of the Boylston Street and Jersey Street intersection.

4.4.6 Public Transportation

The Project Site is currently served by several Massachusetts Bay Transportation Authority's (MBTA) public transportation services, as demonstrated in Figure 4.10. Numerous MBTA bus routes are available within a 0.5-mile radius from the Project Site. The Green Line's D stop at Fenway Station is the closest subway stop to the Project Site, located about a 0.5-mile to the northwest. The Green Line's Kenmore Station (for the B, C, and D branches) to the northeast is located approx. 0.5-mile from the Project Site. Eight local bus routes serve the study area. The stop nearest the Project Site is about 500 feet north on Boylston Street at Ipswich Street. This bus stop is serviced by MBTA Route 55. Additionally, the Framingham / Worcester Commuter Rail line is accessible from the Project Site via the Yawkey Station. Peak period frequencies / headways for MBTA services are summarized in Table 4-2.

Table 4-2 MBTA Bus and Subway Service

Transit Line / Route	Origin / Destination	Rush-Hour Frequency (minutes)
Route 8	Harbor Point / UMass – Kenmore Station	12 - 25
Route 19	Fields Corner Station – Kenmore Station or Ruggles Station	4 - 30
Route 47	Central Square, Cambridge – Broadway Station	10-20
Route 55	Jersey & Queensberry – Copley Square or Park & Tremont Streets via Ipswich Street	15 – 30
Route 57	Watertown Yard or Oak Square – Kenmore Station	3 - 10
Route 60	Chestnut Hill – Kenmore Station	20 - 35
Route 65	Brighton Center – Kenmore Station	10 - 11
Route CT2	Sullivan Station – Ruggles Station	20
Green Line	Park Street – Boston College (B), North Station – Cleveland Circle (C), Park Street – Riverside (D),	6 – 7
Commuter Rail	Yawkey Station – Framingham / Worcester	Schedule Varies

Source: MBTA Fall 2018

A description of each MBTA bus and subway line that services the Project Site is provided below:

Route 8 – Harbor Point / UMass – Kenmore Station

This route connects Kenmore Station in the Fenway Neighborhood with Harbor Point / UMass in Dorchester via the Ruggles Station and Boston University (BU) Medical Campus. The nearest bus stop to the Project Site is located at Brookline Avenue at Jersey Street of 132 Brookline Avenue opposite Fullerton Street. Stops along the route connect to the Green Line, Orange Line, Red Line, Silver Line, and Commuter Rail. The bus route runs on the weekdays from 5:15 AM to 12:56 AM with 12-25 minute headways during peak hours. On Saturday, service runs from 6:30 AM to 1:01 AM, and on Sunday, service is from 6:30 AM to 1:01 AM.

Route 19 – Fields Corner Station – Kenmore Station or Ruggles Station

This route connects Kenmore Station or Ruggles Station in the Fenway Neighborhood with Fields Corner in Dorchester. The nearest bus stop to the Project Site is located at Brookline Avenue at Jersey Street or 132 Brookline Avenue opposite Fullerton Street. Stops along the route connect to the Green Line, Orange Line, Red Line, Silver Line, and Commuter Rail. The bus route runs on weekdays from 5:50 AM to 7:45 PM with 4-30 minute headways during peak hours.

Route 47 – Central Square, Cambridge – Broadway Station

This route connects Central Square in Cambridge with the Broadway Station. The nearest bus stop to the Project Site is located at Fenway Station. Stops along the bus route connect to the Green Line, Orange Line, Red Line, and Commuter Rail. The weekday service runs from 5:15 AM to 1:24 AM with 10-20 minute headways during peak hours. On Saturday, the bus route runs from 5:00 AM to 1:40 AM, and Sunday service is from 7:30 AM to 1:04 AM.

Route 55 – Jersey & Queensberry – Copley Square or Park & Tremont Streets via Ipswich Street

This route connects the Park Street and Tremont Street intersection by the Boston Common and Copley Square to the Fenway / Kenmore area via Ipswich Street. The nearest bus stop to the Project Site is located at Ipswich Street at Boylston Street. Various stops along the bus route connect to the Green Line, Red Line, and Silver Line. The weekday service runs from 5:48 AM to 11:10 PM with 15-30 minute headways during peak hours. On Saturday, the service runs from 6:00 AM to 11:11 PM, and Sunday service is from 8:15 AM to 11:09 PM.

Route 57 – Watertown Yard or Oak Square – Kenmore Station

This route connects Watertown Yard or Oak Square to the Kenmore Station. The nearest bus stop to the Project Site is located at the Kenmore Station. Stops along the bus route connect to the Green Line. The weekday service runs from 4:33 AM to 1:30 AM with 3-10 minute headways during peak hours. On Saturday, the service runs from 4:33 AM to 1:21 AM, and Sunday service is from 6:00 AM to 1:32 AM.

Route 60 – Chestnut Hill – Kenmore Station

This route connects Chestnut Hill Mall in Brookline to Kenmore Station in the Fenway neighborhood. The nearest bus stop to the Project Site is located at Brookline Avenue at Jersey Street or 132 Brookline Avenue opposite Fullerton Street. Stops along this route connect to the Green Line. The weekday service runs from 4:55 AM to 12:18 AM with 20-35 minute headways during peak hours. On Saturday, the service runs from 4:55 AM to 1:01 AM, and Sunday service is from 6:00 AM to 9:51 PM.

Route 65 – Brighton Center – Kenmore Station

This route connects Brighton Center to Copley Square to Kenmore Station in the Fenway neighborhood. The nearest bus stop to the Project Site is located at Brookline Avenue at Jersey Street or 132 Brookline Avenue opposite Fullerton Street. Stops along this route connect to the Green Line. The weekday service runs from 5:58 AM to 8:58 PM with 10-11 minute headways during peak hours. On Saturday, the service runs from 6:45 AM to 6:39 PM. There is no Sunday service.

Route CT2 – Sullivan Station – Ruggles Station

This route connects Sullivan Station in Charlestown to Ruggles Station in Boston via Vassar Street. The nearest bus stop to the Project Site is located at Fenway Station. Stops along the route connect to the Green Line, Orange Line, Red Line, and Commuter Rail. The weekday service runs from 5:55 AM to 7:36 PM with 20-minute headways during peak hours. There is no weekend service.

Green Line – B, C, D Lines

The Green Line has three routes that travel through Hynes and Kenmore and branch off to serve the surrounding communities. The B Line extends to Boston College in Brighton, the C Line extends to Cleveland Circle in Brighton, and the D Line extends to Riverside Station in Newton. The nearest stops to the Project Site are located at Fenway Station (D line only), Kenmore Station (B, C, or D lines) and Hynes Convention Center (B, C, or D line). The weekday service runs from 5:01 AM to 12:47 AM with 6-7-minute headways during rush hour. On Saturday, service runs from 4:45 AM to 12:47 AM, and Sunday service is from 5:20 AM to 12:47 AM.

Commuter Rail – Yawkey Station – Framingham / Worcester

The Yawkey Station on David Ortiz Drive services the Framingham / Worcester Line. The trains depart from South Station in Boston and end at their respective route destinations. Schedule information varies according to the time of day, day of the week, and destination.

4.4.7 Existing Parking and Carshare Locations

The Project Site currently provides 15 striped parking spaces for authorized vehicles in the back of the building along Private Alley 937. These 15 spaces are anticipated to be maintained as part of the Project. They will be accommodated in the basement with access via Private Alley 937. No net-new parking is proposed, which will support the need for alternative modes of transportation. This will also minimize the construction duration and neighborhood impacts. Figure 4.11 demonstrates the parking regulations within a 0.25-mile radius of the Project Site. Along Boylston Street, there are metered spaces along both sides of the street, five of which will be maintained on the Project Site side of Boylston Street. Additionally, Figure 4.12 demonstrates the existing off-street parking options around the neighborhood.

There are currently three Zipcar carsharing locations near the Project Site. The 1330 Boylston Street location, approx. 0.1 mile to the west, provides two vehicles. The Park Drive at Jersey Street Zipcar location, approx. 0.25-mile to the south, provides five vehicles. The 1 Kilmarnock Street / Trilogy Garage Zipcar location, approx. 0.25-mile west of the Project site, provides four vehicles. There is also a Getaround carshare location at the Harlo (1350 Boylston Street), which provides one vehicle. Figure 4.9 demonstrates the carshare locations (along with the bikeshare locations, as previously demonstrated) in the vicinity of the Project Site.

4.4.8 Crash Analysis

A detailed crash analysis was conducted to identify potential vehicle accident trends and roadway deficiencies in the traffic study area. On all study area intersections, the calculated crash rates are below the MassDOT District 6 average crash rates. The most current vehicle accident data for the traffic study area intersections was obtained from MassDOT for the years 2012 to 2016. The MassDOT database is comprised of crash data from the Massachusetts Registry of Motor Vehicles (RMV) Division primarily for use in traffic studies and safety evaluations. Data files are provided for a city or town for an entire year, though it is possible that some crash records may be omitted either due to individual crashes not being reported, or the city crash records not being provided in a compatible format for RMV use. A summary of vehicle accident history at the study intersections based on the available RMV data is demonstrated in Table 4-3.

Crash rates are calculated based on the number of accidents at an intersection and the volume of traffic traveling through that intersection daily. Rates that exceed MassDOT's average for accidents, at intersections in the district in which the town or city is located, could indicate safety or geometric issues for an intersection. As Boston is in MassDOT's District 6, the calculated crash rates were compared to those of MassDOT District 6, which are 0.70 for signalized intersections and 0.53 for unsignalized intersections. These rates imply that, on average, 0.70 accidents occurred per million vehicles entering signalized intersections throughout District 6, and 0.53 accidents occurred per million vehicles entering unsignalized intersections.

Review of the accident data indicates that all study area intersections are below the district crash rate averages. The intersection of Boylston Street at Brookline Avenue / Park Drive has the highest number of crashes in the study area with a total of 33 crashes occurring at the intersection over the five-year period. The most common type of crash at the intersection was angled crashes. 3 of the 33 crashes at the intersection involved non-motorists (e.g. pedestrians and bicyclists).

According to the MassDOT Top Crash Locations interactive map, the study area intersection of Boylston Street at Brookline Avenue / Park Drive was identified as a 2013-2015 Highway Safety Improvement Program (HSIP) Cluster, and as a 2006-2015 HSIP Bicycle Cluster.

Table 4-3 Vehicular Crash Summary (2012-2016)

	Boylston Street at Brookline Avenue / Park Drive (West)	Boylston Street at Kilmarnock Street	Boylston Street at Jersey Street	Jersey Street at Van Ness Street	Brookline Avenue at Jersey Street / David Ortiz Drive	Boylston Street at Ipswich Street	Boylston Street at Park Drive (East)	Gaston Square – Boylston Street at Charlesgate
Signalized?	Yes	Yes	Yes	No	No	Yes	Yes	Yes
MassDOT Average Crash Rate	0.7	0.7	0.7	0.53	0.53	0.7	0.7	0.7
Calculated Crash Rate	0.51	0.1	0	0	0.06	0.02	0.13	0.05
Exceeds Average?	No	No	No	No	No	No	No	No
Year								
2012	2	1	0	0	0	0	2	1
2013	8	0	0	0	0	0	0	0
2014	11	1	0	0	0	0	0	0
2015	6	1	0	0	1	0	2	1
2016	6	1	0	0	0	1	2	2
Total	33	4	0	0	1	1	6	4
Collision Type								
Angle	15	1	0	0	0	0	2	0
Head-on	2	0	0	0	0	0	1	0
Rear-end	5	0	0	0	0	0	3	1
Sideswipe, same direction	6	1	0	0	0	0	0	3
Single Vehicle Crash	4	2	0	0	0	0	0	0
Not reported	1	0	0	0	1	1	0	0
Severity								
Fatal Injury	0	0	0	0	0	0	0	0
Non-Fatal Injury	11	2	0	0	1	0	3	1
Property Damage Only	17	0	0	0	0	0	3	3
Not Reported	5	2	0	0	0	1	0	0
Time of Day								
Weekday, 7:00 AM – 9:00 AM	4	1	0	0	0	0	0	0
Weekday, 4:00 – 6:00 PM	4	1	0	0	1	0	1	0
Saturday, 11:00 AM – 2:00 PM	0	0	0	0	0	0	0	0
Weekday, other time	18	2	0	0	0	0	5	2
Weekend, other time	7	0	0	0	0	1	0	2
Pavement Conditions								
Dry	27	3	0	0	0	0	4	3
Wet	5	0	0	0	0	0	2	1
Not reported	1	1	0	0	1	1	0	0
Non-Motorist (Bicycle, Pedestrian)	3	2	0	0	1	0	1	0

4.5 Future Transportation Conditions

Two future conditions were evaluated for a five-year time horizon (2018-2023) to assess the potential Project-related traffic impacts: 2023 No-Build Conditions and 2023 Build Conditions. These future conditions are summarized in the sections below.

4.5.1 2023 No-Build Condition

The 2023 No-Build Condition was developed to evaluate future transportation conditions in the traffic study area without consideration of the Project. In accordance with the BTD Guidelines, this future analysis year represents a five-year time horizon from existing conditions (2018-2023). The No-Build Condition provides insight into future traffic conditions resulting from regional growth and traffic generated by specific planned projects that are expected to affect the local roadway network.

General Background Growth

A background growth rate of 0.5% per year was applied to the 2018 Existing Condition traffic volumes to account for population growth and smaller projects that cannot be specifically identified. This background growth rate is consistent with other traffic studies in the Kenmore / Fenway area.

Area Development Projects

In addition to the background growth rate, traffic projections for several specific planned or approved projects were also incorporated into the development of the 2023 No-Build Condition. These include the following development projects:

- 2 Charlesgate West – Proposed to include the construction of a 29-story, 344,000 SF residential tower with ground-floor restaurant and office space. The program would include 10,000 SF of restaurant space, 7,500 SF of office space, 173 rental apartment units, and 122 condominium units. The project is proposed to provide 186 parking spaces.
- 60-80 Kilmarnock Street – Involves the construction of two, eight-story residential buildings totaling 443,912 SF with approx. 443 units. The project will provide 250 parking spaces.
- 560 Commonwealth Avenue (Kenmore Square Hotels) – Involves the construction of two new hotel buildings. The Commonwealth Avenue component of the project will demolish the existing Citizens bank and replace it with a new 161,000 SF, 382-room micro-hotel with ground-floor retail space and rooftop amenity space. The Beacon Street Component of the project will demolish the existing parking structure and replace it with a new 186,000 SF, 295-room hotel with meeting space, a café / lounge, below-grade parking, and rooftop amenity space. The existing Buckminster Hotel at the corner will be retained. The project will provide approx. 145 parking spaces.

- 839 Beacon Street – Involves the construction of a five-story, mixed-use building containing 45 residential units and 4,500 SF of ground-floor retail. The project will provide 30 parking spaces.
- 1241 Boylston Street (Fenway Hotel) – Involves the constriction of an eight-story, 105,000 SF hotel which includes 184 hotel rooms and 4,600 SF of ground-floor retail. The project will provide 82 parking spaces.
- Fenway Center – Involves the construction of five buildings ranging from 7-27 stories on MassDOT Turnpike Air Rights Parcel 7. The project includes residential, retail, office, and a shared garage. This project also includes an expansion of Yawkey Station. The project will provide 750 public spaces in the shared garage and 590 private spaces below the two residential buildings. The project will be constructed in two phases.
- Kenmore Square Redevelopment – Involves the construction of two new mixed-use buildings, totaling 256,015 SF of office and 24,485 SF of retail space. The project will provide 60 parking spaces.
- Landmark Center – Involves two distinct phases. The first phase is under construction now and involves the reconfiguration of the parking lot and construction of an approx. 1.1-acre open space along Park Drive and food hall. The second phase involves the construction of a new 14-story mixed-use building with retail and office / laboratory uses, totaling 506,000 SF. No new parking is being proposed for this project.
- The Pierce – Involved the construction of a new 30-story mixed use building totaling 390,460 GSF with 350 residential units and 20,000 SF of retail. No new parking was proposed for this project. This project was completed in 2018.

The 2023 No-Build Condition peak hour traffic volumes were developed by increasing the 2018 Existing Condition volumes to include general background traffic growth as previously described and adding traffic volumes associated with known traffic forecasts projected for other development projects in the area.

Figures 4.13 and 4.14 demonstrate the 2023 No-Build Condition traffic volumes for the weekday morning and evening, respectively.

4.5.2 2023 Build Condition

To estimate traffic impacts of the Project, it is necessary to determine the traffic volumes expected to be generated by the Project. The 2023 Build Condition includes the 2023 No-Build Condition background traffic growth with the addition of the Project-generated trips.

Unadjusted Trip Generation

To assess the traffic impacts of the Project, trip estimates were based on standard rates from the ITE *Trip Generation,* 10th Edition. Trip generation for the proposed residential building was estimated based on the ITE Land Use Codes as demonstrated in Table 4-4 below.

Table 4-4 Trip Generation Land Use Codes

Land Use	ITE Land Use Code (LUC)	Project Program
Residential	225 – Off-Campus Student Apartment	618 Beds[1]
Retail	820 – Shopping Center	16,325 SF

[1] LUC 225 generates trips based on number of beds (See table 4-1)
Source: *Trip Generation Manual*, 10th Edition, Institute of Transportation Engineers; Washington, D.C. (2017)

A summary of the unadjusted trip generation for the Project is demonstrated below in Table 4-5.

Table 4-5 Unadjusted Project-Generated Trips

		Residential	Retail	Total
Daily	In	973	329	1,302
	Out	973	329	1,302
	Total	**1,946**	**658**	**2,604**
Morning Peak Hour	In	30	10	40
	Out	44	6	50
	Total	**74**	**16**	**90**
Evening Peak Hour	In	77	32	109
	Out	77	35	112
	Total	**154**	**67**	**121**

Source: *Trip Generation Manual*, 10th Edition, Institute of Transportation Engineers; Washington, D.C. (2017)

Adjusted Trip Generation

Trip generation estimates demonstrated in Table 4-5 do not include any adjustments to reflect existing land uses, vehicle occupancy rates, public transit, walking trips, or bicycle trips that are characteristic of an urban downtown location.

Currently, the existing Project Site contains approx. 29,000 SF of retail space and approx. 24,000 SF of office space. To account for the persons traveling to and from the Project Site today, a credit was applied to the existing land uses. Table 4-6 provides the credit that will be applied to the Project-generated trips.

Table 4-6 Existing Project Site-Generated Trips

		Total
Daily	In	-132
	Out	-132
	Total	**-264**
Morning Peak Hour	In	-7
	Out	-3
	Total	**-10**
Evening Peak Hour	In	-11
	Out	-16
	Total	**-27**

Source: *Trip Generation Manual*, 10th Edition, Institute of Transportation Engineers; Washington, D.C. (2017)

Additionally, National Household Travel Survey vehicle occupancy rates of 1.18 persons per vehicle were applied to the new residential trips and 1.67 persons per vehicle to the new retail trips.

To account for alternative modes of transportation, mode shares for the area, based on the BTD Guidelines published under the *Access Boston 2000-2012* initiative for Area 4, were applied to the Project-generated unadjusted ITE trip results. Mode shares are demonstrated in Table 4-7.

Table 4-7 Mode Shares

Residential	Auto	Transit	Walk / Bicycle / Other
Daily	24%	19%	57%
AM / PM Peaks	21%	15%	64%
Retail			
Daily	33%	21%	46%
AM / PM Peaks	33%	31%	36%

Source: BTD Area 4 Mode Shares

The adjusted trip generation estimates are demonstrated in Table 4-8. As demonstrated, the Project is expected to generate a total of only six vehicle trips (zero entering and six exiting) during the weekday morning peak hour, and a total of 14 vehicle trips (nine entering and five exiting) during the weekday evening peak hour.

Table 4-8 Net-New Project-Generated Trips by Mode

	Transit (Person)	Walk / Bicycle / Other (Person)	Auto (Vehicle)	Existing Site Vehicle Trips[1]	Net-New Vehicle Trips
Daily					
Enter	254	706	263	-132	131
Exit	254	706	263	-132	131
Total	**508**	**1,412**	**526**	**-264**	**262**
Weekday AM Peak					
Enter	8	23	7	-7	0
Exit	8	30	9	-3	6
Total	**16**	**53**	**16**	**-10**	**6**
Weekday PM Peak					
Enter	21	60	20	-11	9
Exit	22	62	21	-16	5
Total	**43**	**122**	**41**	**-27**	**14**

[1] Existing Site Vehicle Trips were estimated based on *Trip Generation Manual*, 10th Edition, Institute of Transportation Engineers, Washington D.C. (2017)

Vehicle Trip Distribution

Trip distribution was based on the BTD's Guidelines for Area 4 (where the Project is located). The Area 4 trip distribution rates are based on the 2000 Census data about where residents work and where employees live. The Project-generated vehicle trips were assigned to the roadway network accordingly. A summary of the regional trip distribution results is demonstrated in Table 4-9 on the following page.

Table 4-9 Project Trip Distribution

Corridor	In	Out
Boylston Street (to / from East)	71%	71%
Jersey Street (to / from North)	0%	2%
Kilmarnock Street (to / from North)	4%	2%
Longwood (to / from West)	25%	25%

Source: BTD Area 4 Trip Distribution

The Project-generated vehicle trips were added to the 2023 No-Build Condition traffic networks using the local trip distribution patterns described above. The Project-generated trips are demonstrated in Figure 4.15 and 4.16 for the weekday morning and evening peak hours, respectively. The Project-generated trips were then added to the No-Build vehicle volumes and demonstrated in Figure 4.17 and 4.18

Pedestrian Environment and Accessibility

The Project will improve an underutilized site – which currently contains buildings that have exhausted their useful lives – by delivering a program comprised of purpose-built mixed-uses and an enhanced public realm, while thoughtfully connecting the Project Site to the Boylston Street corridor.

Transparency of the street-level experience, through the design of glass storefronts, proper street lighting and upgraded, wide sidewalks, will enhance the safety and atmosphere of the block for the pedestrian and neighborhood experience.

Bicycle Access

The Project will provide secure, indoor bicycle storage for building occupants, as well as outdoor bicycle racks for visitor and public use. After discussions with the BTD staff, the Project has been approved to provide covered bicycle parking at a rate of 0.5 spaces per unit which totals to approx. 267 spaces. Residents will also have the option to request an in-unit bicycle storage solution. A total number of outdoor bicycle racks will be confirmed once the design for the landscaping area along Boylston Street is complete and reviewed with the BTD.

Loading and Service

A key element to the Project design is fully-furnished, turn-key units. Residents will require minimal luggage, therefore negating the need for large moving vehicles and use of the loading dock in Private Alley 937.

Consistent with existing conditions, all ground-floor retail delivery and trash removal will be handled along Private Alley 937. On trash removal days, bins from the residential portion of the Project will be removed by building staff to Private Alley 937. Differentiating from existing conditions, the Project will improve upon current trash removal operations by removing all existing dumpsters from the Project Site. The Proponent will commit to state-of-the-art, efficient trash removal operations, including the installment of an indoor trash compactor for daily trash disposal, which will lie on top of a rail system during scheduled pickups.

A new loading dock will be designed for various retail uses and delivery schedules. This dock will be managed by full-time and extensively-trained staff to ensure seamless delivery and coordination between retail tenants at appropriate hours.

4.6 Transportation Demand Management

Consistent with the City's goals to reduce automobile-dependency, the Project and its Proponent will incorporate proactive TDM measures to encourage alternative modes of transportation. Building staff will provide transit information and orientation packets (e.g. schedules, maps, and fare information) in the Project's lobby for residents. Management will also work directly with tenants, both resident and retail, as they move in, in order to raise awareness of public transportation options.

The following discusses an array of TDM measures that could be implemented. A description of the TDM elements is demonstrated in this section along with information on how those elements aid Project residents. Measures being considered as part of the Project include:

- The Proponent will designate a Transportation Coordinator to oversee move-in and move-out operations, as well as promote the use of alternative transportation measures and carpooling.
- The Proponent will consider providing real-time transit information displayed on-screen in the entry of the building, as well as provide maps and schedules in the resident welcome package.
- The Project will provide 267 covered bicycle storage spaces, supplemented by in-unit bicycle storage equipment options and onsite exterior bicycle racks. Bicycle racks, signs, and parking areas will conform to City standards and be installed in safe, secure locations. Building occupants will also have the option to request an in-unit bicycle storage solution.
- The Proponent will orient residents with ridesharing, carsharing and carpool options within proximity to the Project site.
- The Proponent will work with the City to provide safe pedestrian access to the Project from the surrounding area.
- Retail and restaurant tenants will be encouraged to provide an Emergency Ride Home program, similar to MassRides.
- Residents will be discouraged from requesting Fenway resident parking permits through their lease.

4.7 Parking

The existing 15 surface parking spaces along Private Alley 937 will be taken out of service and replaced with 15 parking spaces in the basement level of the Project with access via Private Alley 937. No net-new parking will be created in connection with the Project which will not only support the need for alternative modes of transportation but will also minimize the construction schedule and neighborhood impacts. Additionally, five of the existing onsite metered parking spaces will be maintained in the new streetscape design.

4.8 Traffic Operations Analysis

Consistent with City guidelines, Synchro 9 software was used to model LOS operations at the study area intersections. LOS is a qualitative measure of control delay at an intersection providing an index to the operational qualities of a roadway or intersection.

LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. LOS D is considered acceptable. LOS E indicates vehicles experience significant delay while LOS

F suggests unacceptable delay for the average vehicle. LOS thresholds differ for signalized and unsignalized intersections. Longer delays at signalized intersections are perceived as acceptable.

Table 4-10 below demonstrates the LOS delay threshold criteria as defined in HCM.

Table 4-10 LOS Criteria

Level of Service	Unsignalized Intersection Control Delay (sec/vehicle)	Signalized Intersection Control Delay (sec/vehicle)
LOS A	≤ 10	≤ 10
LOS B	> 10-15	> 10-20
LOS C	> 15-25	> 20-35
LOS D	> 25-35	> 35-55
LOS E	> 35-50	> 55-80
LOS F	> 50	> 80

Source: 2000 HCM

Adjustments were made to the Synchro model to include characteristics of the study area such as heavy vehicles, bus operations, parking activity, and pedestrian crossings. The capacity analysis results are summarized in the following sections.

4.8.1 Signalized Capacity Analysis

The LOS results of the signalized capacity analyses are summarized in Table 4-11 for the 2018 Existing, 2023 No-Build, and 2023 Build Condition peak hours. Detailed results including delay by movement, queuing, and volume-to-capacity ratios are demonstrated in Tables 4-12 through 4-17 and the detailed Synchro results are provided in Appendix D.

Table 4-11 Intersection LOS Summary

Intersection	AM Peak Hour			PM Peak Hour		
	Existing	**No-Build**	**Build**	**Existing**	**No-Build**	**Build**
Park Drive/ Boylston Street/ Brookline Avenue	C	D	D	D	D	D
Kilmarnock Street/ Boylston Street	B	B	B	B	B	B
Jersey Street/Boylston Street	B	B	B	B	B	B
Boylston Street/ Ipswich Street	B	B	B	B	B	B
Park Drive/ Boylston Street	C	C	C	A	B	B
Boylston Street/ Charlesgate	D	D	D	C	C	C
Jersey Street/ Van Ness Street	A	A	A	A	A	A
Jersey Street/ David Ortiz Drive/ Brookline Avenue	A	A	A	B	C	C

Table 4-12 Existing Condition (2018) Signalized Intersection LOS Summary – Morning Peak Hour

Intersection / Approach	V/C	Delay (sec)	LOS	50th % Queue (feet)	95th % Queue (feet)
Park Dr / Boylston St / Brookline Ave	**0.80**	**33.6**	**C**	**-**	**-**
Brookline Ave EB L	0.64	68.4	E	46	#110
Brookline Ave T	0.59	30.1	C	164	252
Brookline Ave R	0.74	17.5	B	238	313
Brookline Ave WB T	0.41	33.7	C	74	104
Brookline Ave WB R	0.23	31.9	C	15	60
Park Dr NB L/T/R	0.77	38.1	D	175	207
Boylston St NWB L/T	0.72	36.1	D	154	211
Boylston St NWB R	0.69	84.0	F	83	#195
Kilmarnock Street / Boylston Street	**0.58**	**13.0**	**B**	**-**	**-**
Boylston St EB L/T/R	0.63	14.0	B	370	462
Boylston St WB L/T/R	0.45	6.2	A	107	147
Kilmarnock St NB L/T/R	0.15	34.8	C	14	52
Kilmarnock St SB L	0.38	36.7	D	35	76
Kilmarnock St SB T/R	0.14	34.7	C	14	45
Jersey Street / Boylston Street	**0.74**	**10.8**	**B**	**-**	**-**
Boylston St EB L/T/R	0.76	12.0	B	123	252
Boylston St WB L/T/R	0.70	5.0	A	36	45
Jersey St NB L/T/R	0.51	38.9	D	42	96
Boylston Street / Ipswich Street	**0.69**	**17.3**	**B**	**-**	**-**
Boylston St EB L/T	0.86	20.4	C	154	#325
Boylston St WB T/R	0.72	12.1	B	83	m93
Ipswich St SB L	0.25	29.9	C	39	62
Ipswich St SB R	0.31	31.9	C	36	59
Park Drive / Boylston Street	**1.03**	**21.3**	**C**	**-**	**-**
Boylston St EB T	0.95	32.6	C	358	m#469
Boylston St EB R	0.05	12.6	B	8	m11
Boylston St WB L/T	0.96	13.9	B	67	#385
Boylston Street / Charlesgate	**1.16**	**49.1**	**D**	**-**	**-**
Boylston St WB R	1.22	132.4	F	~527	#668
Charlesgate SB L	0.75	25.5	C	248	325
Charlesgate SB R	0.85	15.4	B	228	330
Boylston St NEB L	0.80	21.7	C	153	m173
Boylston St NEB R	0.31	17.7	B	99	m101

~ Volume exceeds capacity, queue is theoretically infinite
# 95th percentile volume exceeds capacity, queue may be longer
m Volume for 95th percentile queue is metered by upstream signal

Table 4-13 Existing Condition (2018) Signalized Intersection LOS Summary – Evening Peak Hour

Intersection / Approach	V/C	Delay (sec)	LOS	50th % Queue (feet)	95th % Queue (feet)
Park Dr / Boylston St / Brookline Ave	**0.70**	**38.5**	**D**	**-**	**-**
Brookline Ave EB L	0.88	113.4	F	75	#180
Brookline Ave T	0.46	33.0	C	141	219
Brookline Ave R	0.46	10.3	B	133	173
Brookline Ave WB T	0.37	39.1	D	88	120
Brookline Ave WB R	0.57	46.5	D	107	184
Park Dr NB L/T/R	0.83	51.3	D	204	240
Boylston St NWB L/T	0.67	39.4	D	206	270
Boylston St NWB R	0.57	41.6	D	97	216
Kilmarnock Street / Boylston Street	**0.52**	**10.9**	**B**	**-**	**-**
Boylston St EB L/T/R	0.52	8.0	A	131	180
Boylston St WB L/T/R	0.50	5.1	A	62	106
Kilmarnock St NB L/T/R	0.25	35.0	D	25	51
Kilmarnock St SB L	0.54	38.4	D	56	109
Kilmarnock St SB T/R	0.22	34.8	C	20	67
Jersey Street / Boylston Street	**0.69**	**13.7**	**B**	**-**	**-**
Boylston St EB L/T/R	0.64	8.3	A	104	140
Boylston St WB L/T/R	0.62	8.7	A	91	110
Jersey St NB L/T/R	0.78	53.1	D	110	120
Boylston Street / Ipswich Street	**0.65**	**14.7**	**B**	**-**	**-**
Boylston St EB L/T	0.72	10.8	B	100	157
Boylston St WB T/R	0.54	11.4	B	152	m190
Ipswich St SB L	0.46	38.2	D	88	142
Ipswich St SB R	0.48	40.4	D	69	120
Park Drive / Boylston Street	**0.97**	**8.5**	**A**	**-**	**-**
Boylston St EB T	0.58	3.4	A	54	63
Boylston St EB R	0.06	1.6	A	1	m2
Boylston St WB L/T	0.95	13.1	B	5	109
Boylston Street / Charlesgate	**0.97**	**30.9**	**C**	**-**	**-**
Boylston St WB R	1.06	72.1	E	~465	#607
Charlesgate SB L	0.74	27.2	C	278	357
Charlesgate SB R	0.67	10.0	A	148	199
Boylston St NEB L	0.74	13.1	B	225	287
Boylston St NEB R	0.20	24.8	C	64	84

~ Volume exceeds capacity, queue is theoretically infinite
# 95th percentile volume exceeds capacity, queue may be longer
m Volume for 95th percentile queue is metered by upstream signal

Table 4-14 No-Build Condition (2023) Signalized Intersection LOS Summary – Morning Peak Hour

Intersection / Approach	V/C	Delay (sec)	LOS	50th % Queue (feet)	95th % Queue (feet)
Park Dr / Boylston St / Brookline Ave	**0.85**	**35.8**	**D**	**-**	**-**
Brookline Ave EB L	0.73	77.6	E	52	#129
Brookline Ave T	0.73	35.7	D	218	329
Brookline Ave R	0.75	17.8	B	244	321
Brookline Ave WB T	0.43	34.0	C	78	107
Brookline Ave WB R	0.29	33.1	C	25	76
Park Dr NB L/T/R	0.85	41.4	D	193	226
Boylston St NWB L/T	0.74	36.4	D	158	216
Boylston St NWB R	0.73	86.4	F	86	#207
Kilmarnock Street / Boylston Street	**0.62**	**14.6**	**B**	**-**	**-**
Boylston St EB L/T/R	0.66	16.0	B	380	470
Boylston St WB L/T/R	0.48	7.10	A	113	154
Kilmarnock St NB L/T/R	0.15	33.5	C	15	55
Kilmarnock St SB L	0.49	36.6	D	51	102
Kilmarnock St SB T/R	0.13	33.4	C	13	47
Jersey Street / Boylston Street	**0.76**	**11.1**	**B**	**-**	**-**
Boylston St EB L/T/R	0.78	12.9	B	132	#284
Boylston St WB L/T/R	0.71	4.70	A	37	47
Jersey St NB L/T/R	0.52	38.9	D	44	97
Boylston Street / Ipswich Street	**0.73**	**18.7**	**B**	**-**	**-**
Boylston St EB L/T	0.90	22.8	C	160	#447
Boylston St WB T/R	0.75	12.2	B	94	m94
Ipswich St SB L	0.32	31.2	C	77	77
Ipswich St SB R	0.34	32.4	C	63	63
Park Drive / Boylston Street	**1.07**	**26.2**	**C**	**-**	**-**
Boylston St EB T	0.97	35.0	D	364	m#456
Boylston St EB R	0.05	12.0	B	8	m11
Boylston St WB L/T	1.00	20.8	C	~93	#424
Boylston Street / Charlesgate	**1.19**	**52.4**	**D**	**-**	**-**
Boylston St WB R	1.24	143.0	F	~546	#688
Charlesgate SB L	0.77	26.1	C	256	335
Charlesgate SB R	0.88	17.5	B	251	368
Boylston St NEB L	0.81	22.3	C	160	m172
Boylston St NEB R	0.34	18.0	B	106	m107

~ Volume exceeds capacity, queue is theoretically infinite
# 95th percentile volume exceeds capacity, queue may be longer
m Volume for 95th percentile queue is metered by upstream signal

Table 4-15 No-Build Condition (2023) Signalized Intersection LOS Summary – Evening Peak Hour

Intersection / Approach	V/C	Delay (sec)	LOS	50th % Queue (feet)	95th % Queue (feet)
Park Dr / Boylston St / Brookline Ave	**0.81**	**42.9**	**D**	**-**	**-**
Brookline Ave EB L	0.94	125.4	F	80	#193
Brookline Ave T	0.52	34.9	C	169	256
Brookline Ave R	0.45	10.4	B	135	176
Brookline Ave WB T	0.45	40.4	D	108	142
Brookline Ave WB R	0.86	62.7	E	186	#310
Park Dr NB L/T/R	0.90	57.0	E	222	#272
Boylston St NWB L/T	0.68	39.8	D	211	276
Boylston St NWB R	0.69	42.6	D	104	227
Kilmarnock Street / Boylston Street	**0.64**	**15.9**	**B**	**-**	**-**
Boylston St EB L/T/R	0.56	10.2	B	153	215
Boylston St WB L/T/R	0.56	6.5	A	63	131
Kilmarnock St NB L/T/R	0.21	32.1	C	23	48
Kilmarnock St SB L	0.89	68.9	E	118	#231
Kilmarnock St SB T/R	0.22	32.1	C	21	69
Jersey Street / Boylston Street	**0.74**	**13.6**	**B**	**-**	**-**
Boylston St EB L/T/R	0.71	9.1	A	104	180
Boylston St WB L/T/R	0.66	8.8	A	91	114
Jersey St NB L/T/R	0.77	52.1	D	109	119
Boylston Street / Ipswich Street	**0.79**	**18.4**	**B**	**-**	**-**
Boylston St EB L/T	0.80	12.4	B	98	241
Boylston St WB T/R	0.58	12.3	B	193	m191
Ipswich St SB L	0.80	54.4	D	169	#271
Ipswich St SB R	0.49	40.8	D	71	122
Park Drive / Boylston Street	**1.06**	**17.6**	**B**	**-**	**-**
Boylston St EB T	0.68	5.2	A	91	105
Boylston St EB R	0.07	2.4	A	3	m4
Boylston St WB L/T	1.07	29.9	C	~108	#263
Boylston Street / Charlesgate	**1.05**	**33.5**	**C**	**-**	**-**
Boylston St WB R	1.08	80.0	E	~484	#626
Charlesgate SB L	0.76	27.9	C	289	371
Charlesgate SB R	0.71	10.8	B	166	225
Boylston St NEB L	0.86	17.4	B	306	411
Boylston St NEB R	0.23	26.1	C	75	99

~ Volume exceeds capacity, queue is theoretically infinite
\# 95th percentile volume exceeds capacity, queue may be longer
m Volume for 95th percentile queue is metered by upstream signal

Table 4-16 Build Condition (2023) Signalized Intersection LOS Summary – Morning Peak Hour

Intersection / Approach	V/C	Delay (sec)	LOS	50th % Queue (feet)	95th % Queue (feet)
Park Dr / Boylston St / Brookline Ave	**0.85**	**35.9**	**D**	**-**	**-**
Brookline Ave EB L	0.73	77.6	E	52	#129
Brookline Ave T	0.73	35.7	D	218	329
Brookline Ave R	0.75	17.8	B	244	321
Brookline Ave WB T	0.43	34.0	C	78	107
Brookline Ave WB R	0.29	33.1	C	25	76
Park Dr NB L/T/R	0.85	41.4	D	193	226
Boylston St NWB L/T	0.74	36.5	D	158	217
Boylston St NWB R	0.74	87.2	F	87	#208
Kilmarnock Street / Boylston Street	**0.62**	**14.6**	**B**	**-**	**-**
Boylston St EB L/T/R	0.66	16.0	B	380	470
Boylston St WB L/T/R	0.48	7.1	A	113	154
Kilmarnock St NB L/T/R	0.15	33.5	C	15	55
Kilmarnock St SB L	0.49	36.6	D	51	102
Kilmarnock St SB T/R	0.13	33.4	C	13	47
Jersey Street / Boylston Street	**0.76**	**11.1**	**B**	**-**	**-**
Boylston St EB L/T/R	0.78	12.9	B	132	#284
Boylston St WB L/T/R	0.71	4.7	A	38	47
Jersey St NB L/T/R	0.52	38.9	D	44	97
Boylston Street / Ipswich Street	**0.73**	**18.8**	**B**	**-**	**-**
Boylston St EB L/T	0.90	23.0	C	160	#450
Boylston St WB T/R	0.75	12.2	B	94	m94
Ipswich St SB L	0.32	31.2	C	51	77
Ipswich St SB R	0.33	32.3	C	38	63
Park Drive / Boylston Street	**1.07**	**26.5**	**C**	**-**	**-**
Boylston St EB T	0.98	35.7	D	365	m#458
Boylston St EB R	0.05	12.0	B	8	m11
Boylston St WB L/T	1.00	20.8	C	~93	#424
Boylston Street / Charlesgate	**1.19**	**52.4**	**D**	**-**	**-**
Boylston St WB R	1.24	143.0	F	~546	#688
Charlesgate SB L	0.77	26.1	C	256	335
Charlesgate SB R	0.88	17.5	B	251	368
Boylston St NEB L	0.82	22.3	C	161	m172
Boylston St NEB R	0.34	17.9	B	105	m107

~ Volume exceeds capacity, queue is theoretically infinite
# 95th percentile volume exceeds capacity, queue may be longer
m Volume for 95th percentile queue is metered by upstream signal

Table 4-17 Build Condition (2023) Signalized Intersection LOS Summary – Evening Peak Hour

Intersection / Approach	V/C	Delay (sec)	LOS	50th % Queue (feet)	95th % Queue (feet)
Park Dr / Boylston St/Brookline Ave	**0.81**	**42.9**	**D**	**-**	**-**
Brookline Ave EB L	0.94	125.4	F	80	#193
Brookline Ave T	0.53	34.9	C	169	256
Brookline Ave R	0.47	10.4	B	135	177
Brookline Ave WB T	0.45	40.4	D	108	142
Brookline Ave WB R	0.82	62.7	E	186	#310
Park Dr NB L/T/R	0.90	57.1	E	223	#273
Boylston St NWB L/T	0.68	39.8	D	211	276
Boylston St NWB R	0.59	42.6	D	104	227
Kilmarnock Street / Boylston Street	**0.64**	**15.9**	**B**	**-**	**-**
Boylston St EB L/T/R	0.56	10.2	B	154	217
Boylston St WB L/T/R	0.56	6.5	A	63	131
Kilmarnock St NB L/T/R	0.21	32.1	C	23	48
Kilmarnock St SB L	0.89	68.9	E	118	#231
Kilmarnock St SB T/R	0.22	32.1	C	21	69
Jersey Street / Boylston Street	**0.74**	**13.6**	**B**	**-**	**-**
Boylston St EB L/T/R	0.71	9.1	A	104	180
Boylston St WB L/T/R	0.66	8.7	A	90	114
Jersey St NB L/T/R	0.77	52.1	D	109	119
Boylston Street / Ipswich Street	**0.79**	**18.5**	**B**	**-**	**-**
Boylston St EB L/T	0.81	12.4	B	99	242
Boylston St WB T/R	0.59	12.4	B	196	m192
Ipswich St SB L	0.80	54.4	D	169	#271
Ipswich St SB R	0.49	40.8	D	71	122
Park Drive / Boylston Street	**1.06**	**18.2**	**B**	**-**	**-**
Boylston St EB T	0.68	5.1	A	91	105
Boylston St EB R	0.07	2.4	A	3	m4
Boylston St WB L/T	1.07	31.0	C	~116	#271
Boylston Street / Charlesgate	**1.05**	**33.5**	**C**	**-**	**-**
Boylston St WB R	1.08	80.0	E	~484	#626
Charlesgate SB L	0.76	27.9	C	289	371
Charlesgate SB R	0.71	10.9	B	168	227
Boylston St NEB L	0.86	17.5	B	306	410
Boylston St NEB R	0.23	26.1	C	76	99

~ Volume exceeds capacity, queue is theoretically infinite
# 95th percentile volume exceeds capacity, queue may be longer
m Volume for 95th percentile queue is metered by upstream signal

As demonstrated in this Section, 4.8.1, during the morning peak hour, the signalized intersection of Boylston Street at Charlesgate operates at a LOS D in the 2018 Existing, 2023 No-Build, and 2023 Build Conditions. The intersection of Park Drive, Boylston Street, and Brookline Avenue experiences a slight decrease in performance from LOS C to LOS D. This is due to increased volumes from the 2018 Existing Condition to 2023 No-Build Condition.

During the evening peak hour, the signalized intersection of Park Drive, Boylston Street, and Brookline Avenue operates at a LOS D in the 2018 Existing, 2023 No-Build, and 2023 Build Conditions.

Overall, the intersections are minimally affected by the additional traffic volumes due to background growth and surrounding projects. The study area intersections demonstrate no change in performance from the 2023 No-Build Condition to the 2023 Build Condition, and all the LOS outcomes remain constant for both the morning and evening peak hours. The traffic volumes generated from the Project will not noticeably affect the surrounding area intersections.

4.8.2 Unsignalized Capacity Analysis

The LOS results of the unsignalized capacity analyses are summarized in Table 4-18 and Table 4-19 for the 2018 Existing, 2023 No-Build, and 2023 Build Condition peak hours.

Table 4-18 Unsignalized Intersection LOS Summary – Morning Peak Hour

Intersection /	2018 Existing			2023 No-Build			2023 Build		
Movement	V/C[1]	Delay[2]	LOS[3]	V/C	Delay	LOS	V/C	Delay	LOS
Jersey Street/ Van Ness Street									
Van Ness St WB T/R	0.30	12.7	B	0.36	13.3	B	0.36	13.3	B
Jersey St NB L/T/R	0.02	1.6	A	0.02	1.5	A	0.02	1.5	A
Jersey Street/ David Ortiz Drive / Brookline Avenue									
Brookline Ave EB	0.01	0.2	A	0.01	0.2	A	0.01	0.2	A
Brookline Ave WB T/R	0.24	0.0	A	0.27	0.0	A	0.27	0.0	A
Jersey Street NB	0.44	26.6	D	0.71	47.3	E	0.71	47.3	E

[1] volume to capacity ratio
[2] delay in seconds
[3] level of service

As demonstrated in Table 4-18 above, during the morning peak hour, all movements at the unsignalized intersections operate at a LOS B or better with the exception of the Jersey Street northbound / Brookline Avenue intersection, which operates at a LOS D in the 2018 Existing Condition and becomes a LOS E in the 2023 No-Build Condition. The intersections are minimally affected by the Project-generated trips added to the study area intersections in the 2023 Build Condition. The traffic volumes generated from the Project will not noticeably affect the surrounding area intersections.

Table 4-19 Unsignalized Intersection Level of Service Summary – Evening Peak Hour

Intersection / Movement	2018 Existing			2023 No-Build			2023 Build		
	V/C[1]	Delay[2]	LOS[3]	V/C	Delay	LOS	V/C	Delay	LOS
Jersey Street / Van Ness Street									
Van Ness St WB T/R	0.40	13.8	B	0.42	12.0	B	0.42	14.0	A
Jersey St NB L/T/R	0.02	1.5	A	0.02	1.5	A	0.02	1.5	A
Jersey Street / David Ortiz Drive / Brookline Avenue									
Brookline Ave EB L/T/R	0.02	0.5	A	0.02	0.7	A	0.02	0.7	A
Brookline Ave WB T/R	0.15	0.0	A	0.19	0.0	A	0.19	0.0	A
Jersey Street NB L/T/R	0.62	31.9	D	0.83	56.3	F	0.83	56.3	F

1 volume to capacity ratio
2 delay in seconds
3 level of service

As demonstrated in Table 4-19 above, the intersections are minimally affected by the Project-generated trips when added to the study area intersections in the 2023 Build Condition. The traffic volumes generated from the Project will not noticeably affect the surrounding area intersections. During the evening peak hour, all movements at the unsignalized intersections operate at a LOS B or better, with the exception of the Jersey Street northbound / Brookline Avenue intersection, which operates at a LOS D in the 2018 Existing Condition and becomes a LOS F in the 2023 No-Build Condition.

4.9 Construction Management

The Proponent will develop a detailed evaluation of potential short-term, construction-related transportation impacts including construction vehicle traffic, parking supply and demand, and pedestrian access. A detailed Construction Management Plan (CMP) will be developed and submitted to the BTD for their approval. These plans will detail construction vehicle routing and staging.

To minimize impacts to the abutters and the local community, the Proponent will consider all available measures during construction activities, including specific construction mitigation measures, construction materials access, and staging area plans. The potential need for street use along roadways adjacent to the Project Site is not known at this time.

Contractors will be encouraged to devise access plans for their personnel that deter automobile use (such as providing transit subsidies and onsite lockers). With the construction workers' early arrival / departure (typically 7:00 AM – 3:00 PM) schedule, a conflict for on-street parking is not anticipated.

During the construction period, pedestrian activity adjacent to the Project Site may be impacted by sidewalk closures. A variety of measures will be considered and implemented to protect the safety of pedestrians. Temporary walkways, appropriate lighting, and new directional and informational signage to direct pedestrians around the construction site will be provided. After construction is complete, finished pedestrian sidewalks will be permanently reconstructed to meet ADA standards around the new facilities. Any damage as a result of construction vehicles or otherwise will be repaired per City standards.

See Chapter 5, *Environmental Protection*, Section 5.13 for further information about air quality, noise, odor, and rodent control.

4.10 Transportation Access Plan Agreement

The Proponent will enter into a Transportation Access Plan Agreement (TAPA) with the BTD which will formalize and document all transportation mitigation and TDM commitments to be made in connection with the Project. The TAPA will assign TDM implementation to the appropriate responsible entity, be that the building owner or tenant.

Specific mitigation measures have not been discussed with the City at this time. Upon the City's review of this transportation analysis and assessment of Project impacts, TDM commitments will be discussed and agreed upon for the Project. A TAPA will be executed for the Project in advance of its building permit issuance.

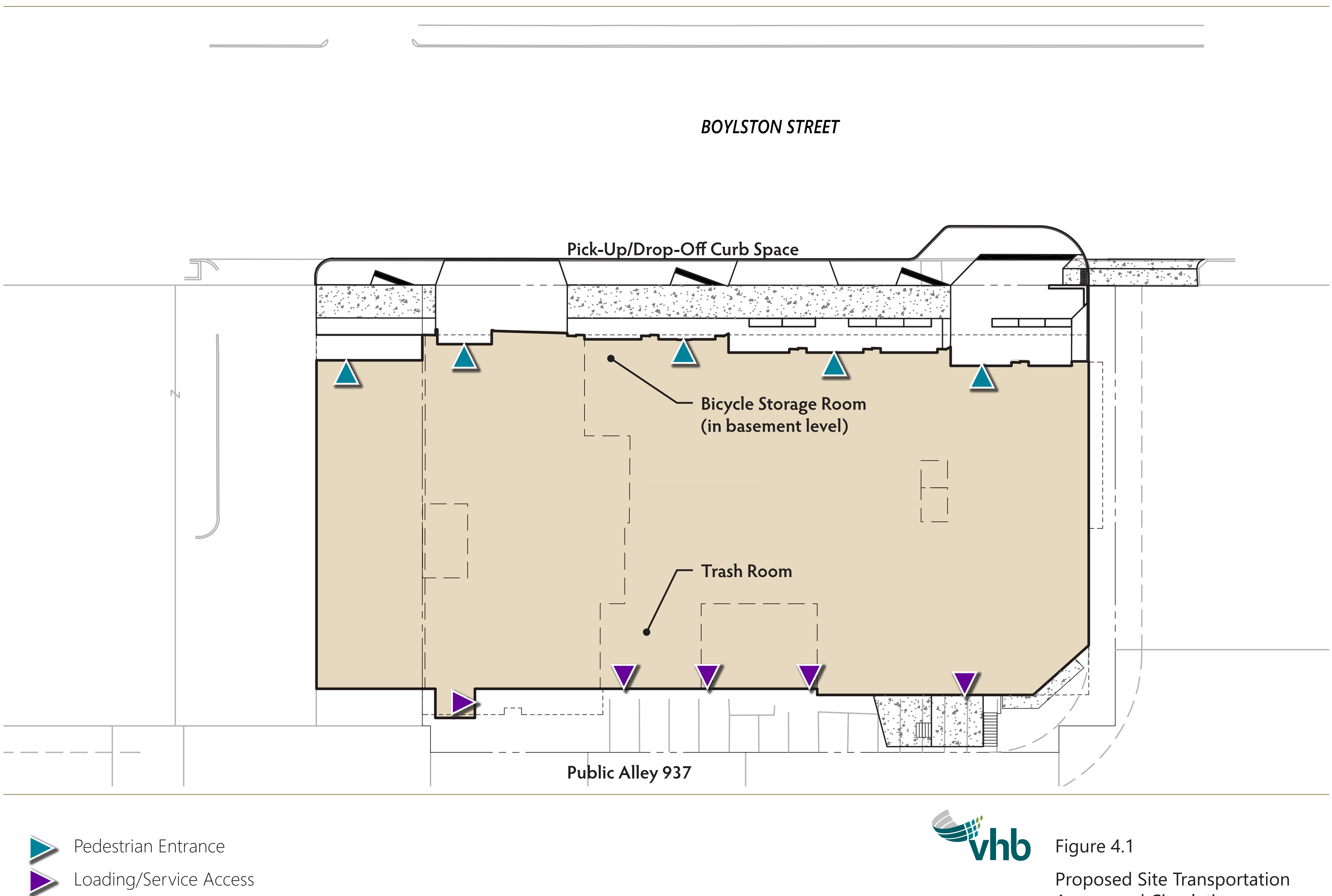


Figure 4.1

Proposed Site Transportation Access and Circulation

1252-1270 Boylston Street
Boston, Massachusetts

Source: ArcGIS Online Bing Aerial

Figure 4.2

Study Area Intersections

1252-1270 Boylston Street
Boston, Massachusetts

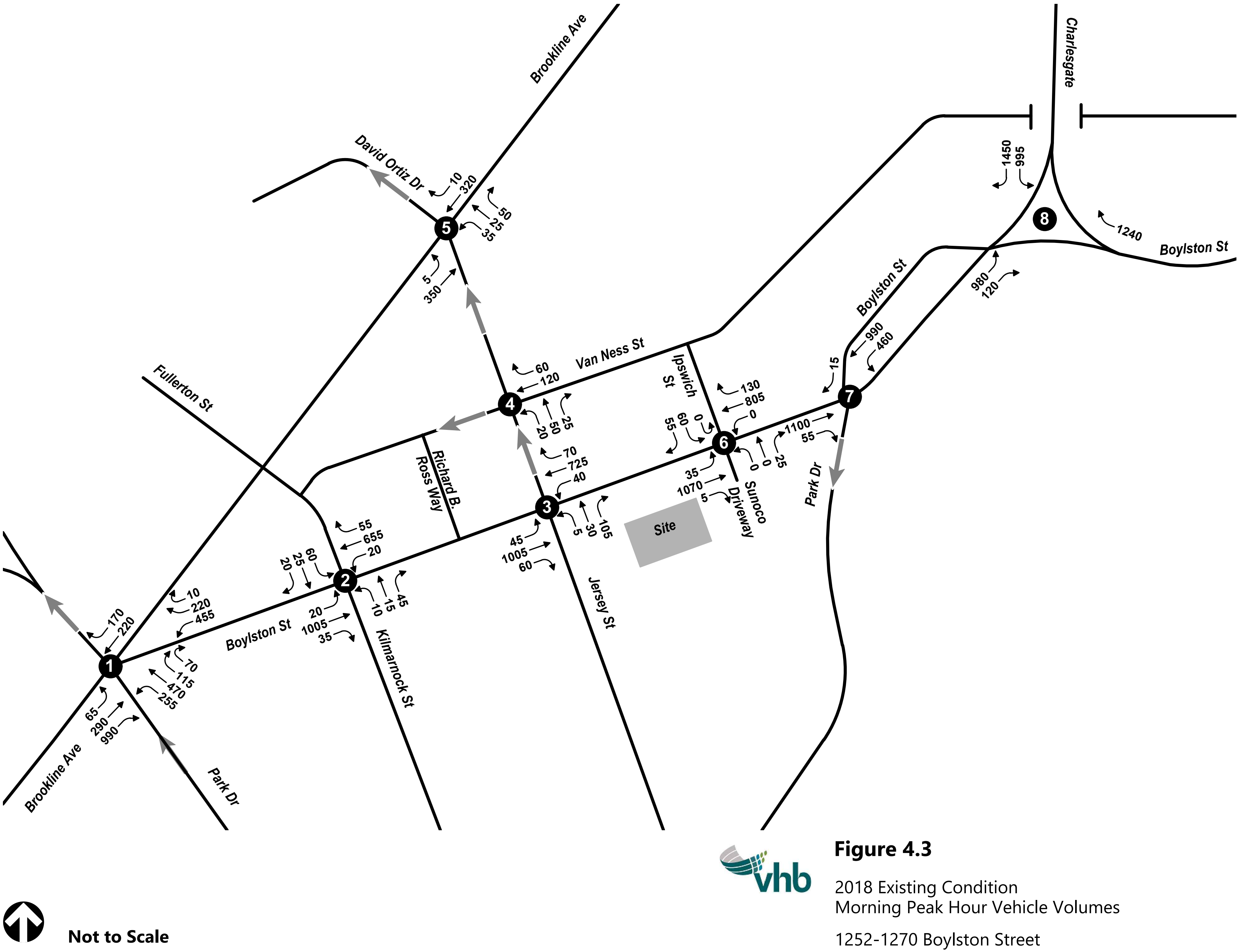


Figure 4.3

2018 Existing Condition
Morning Peak Hour Vehicle Volumes

1252-1270 Boylston Street
Boston, Massachusetts

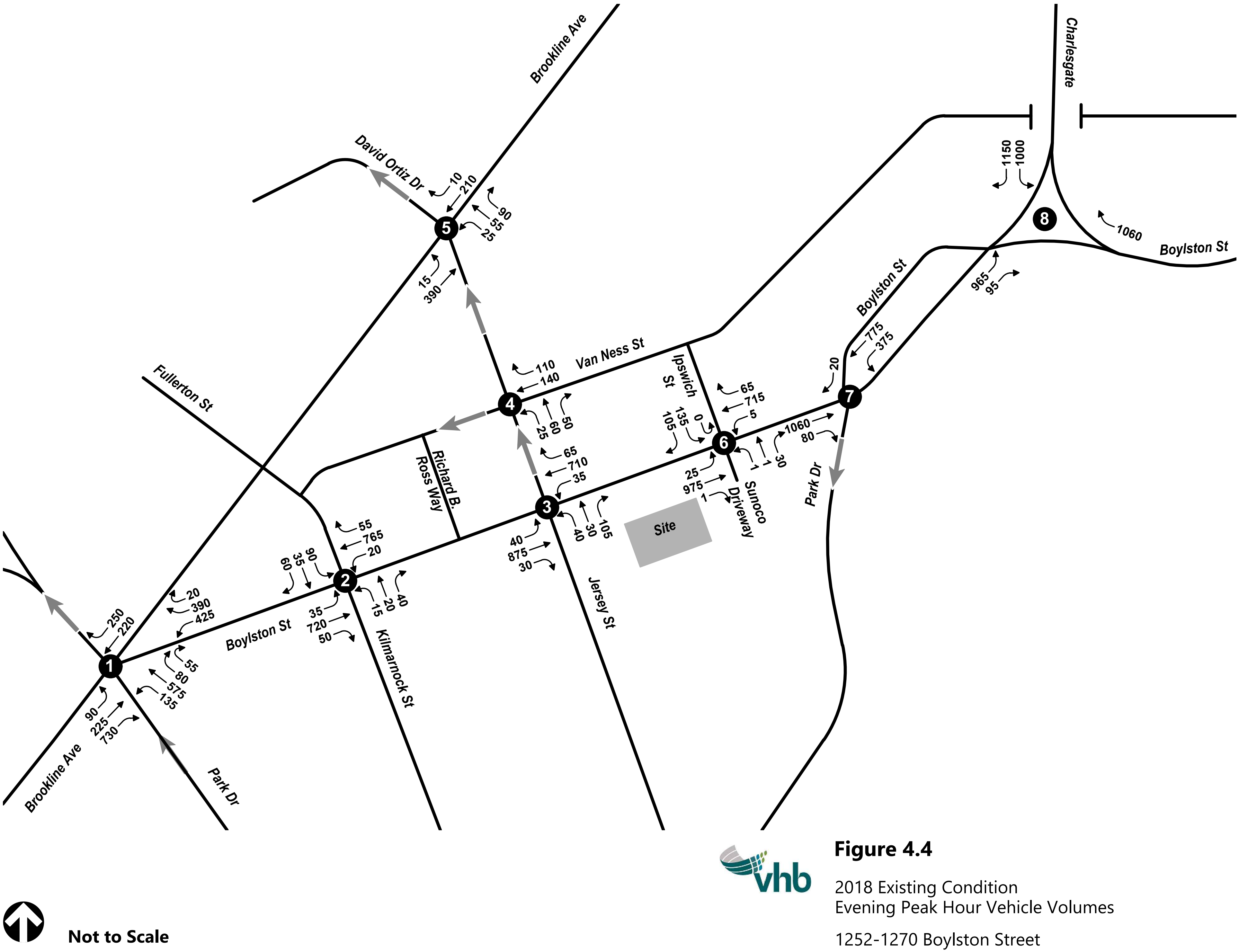


Figure 4.4

2018 Existing Condition
Evening Peak Hour Vehicle Volumes

1252-1270 Boylston Street
Boston, Massachusetts

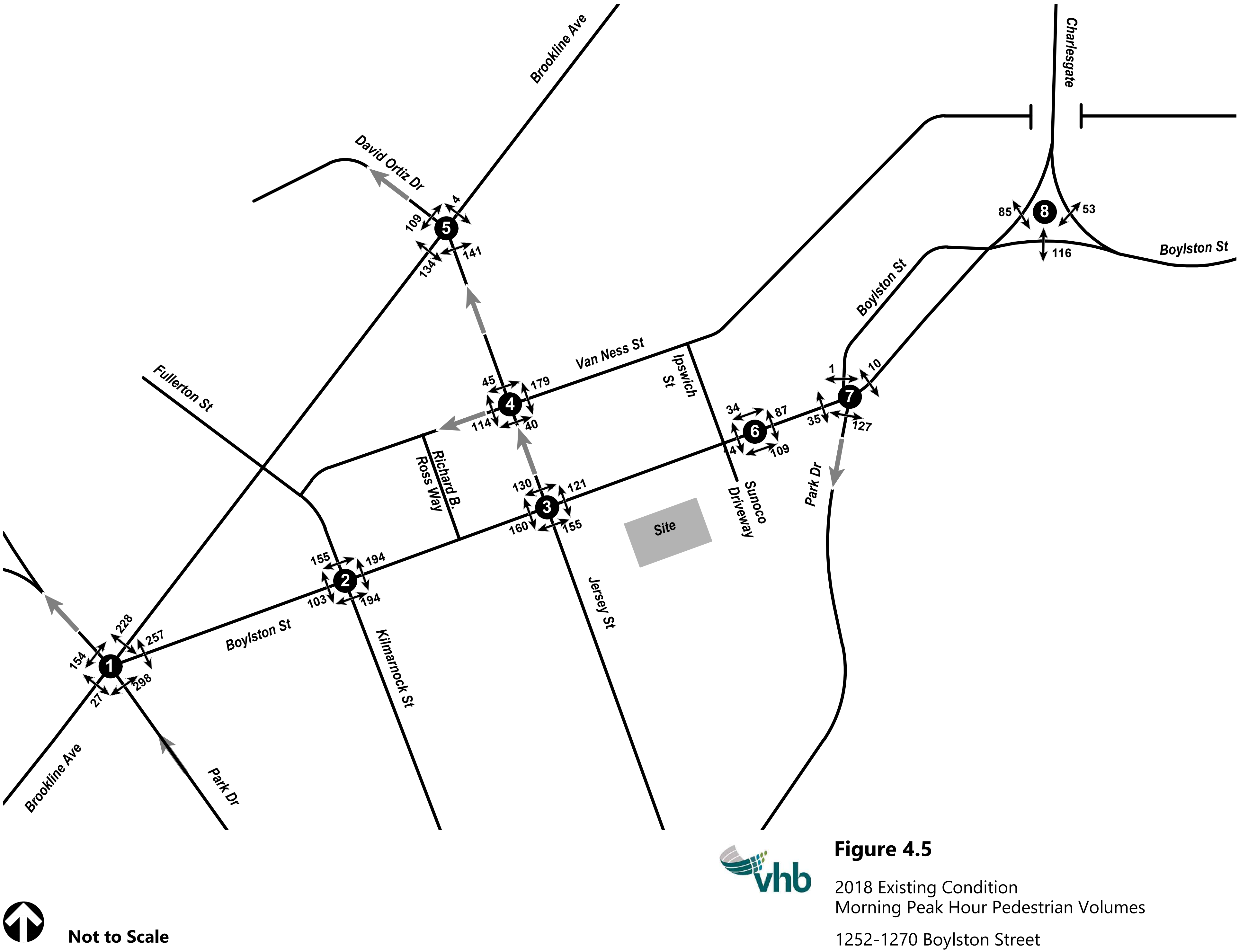


Figure 4.5

2018 Existing Condition
Morning Peak Hour Pedestrian Volumes

1252-1270 Boylston Street
Boston, Massachusetts

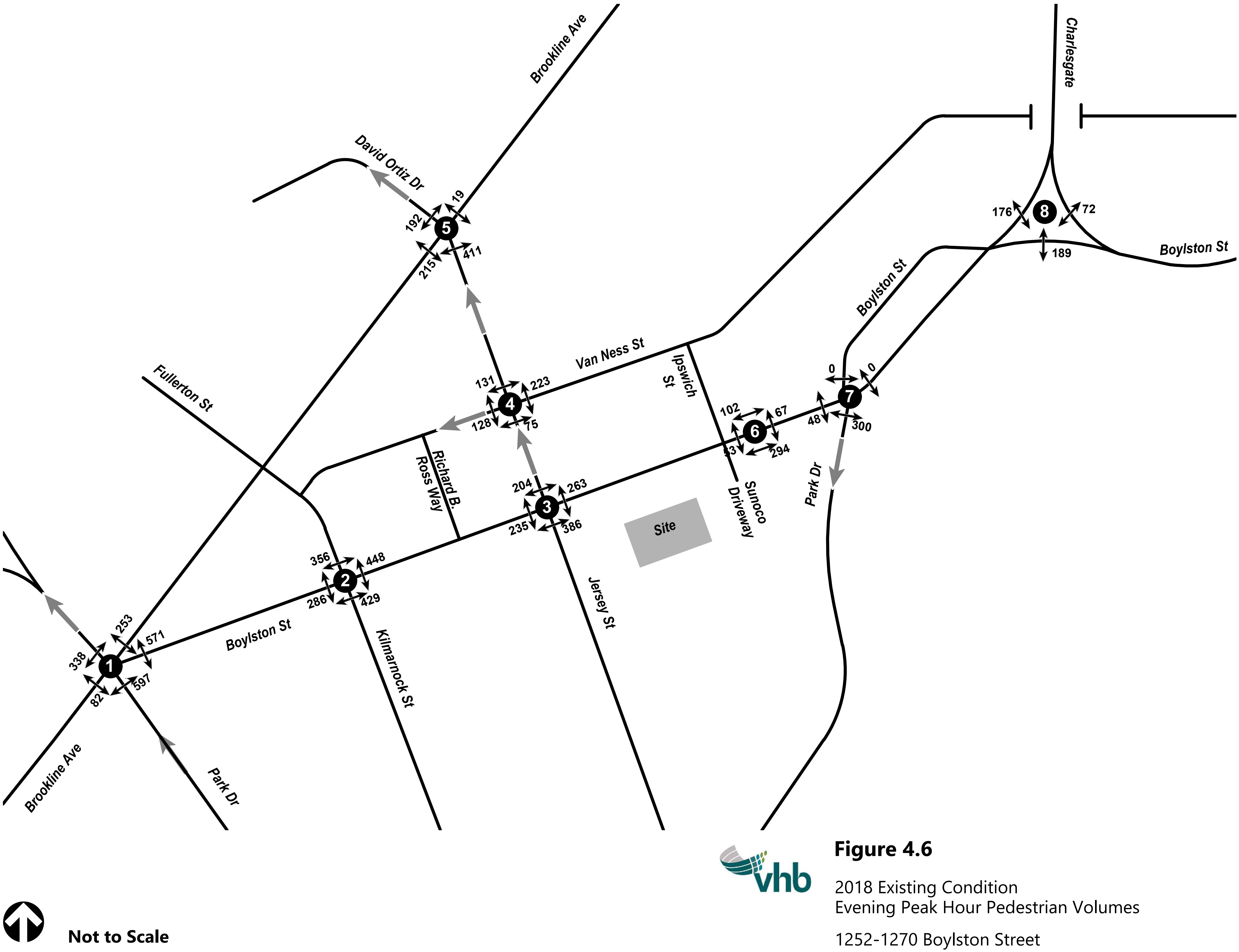
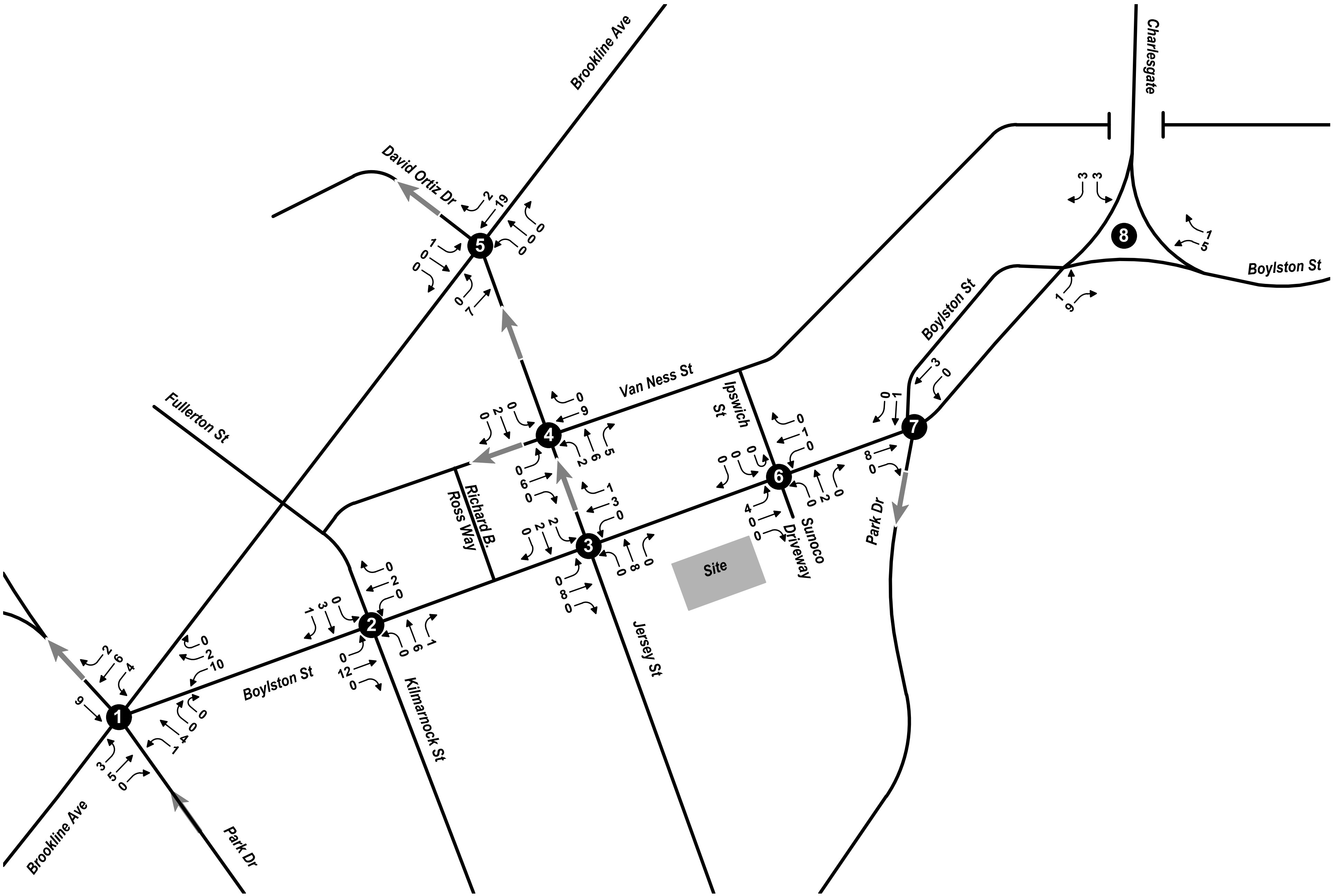


Figure 4.6

2018 Existing Condition
Evening Peak Hour Pedestrian Volumes

1252-1270 Boylston Street
Boston, Massachusetts



Not to Scale

Figure 4.7

2018 Existing Condition
Morning Peak Hour Bicycle Volumes

1252-1270 Boylston Street
Boston, Massachusetts

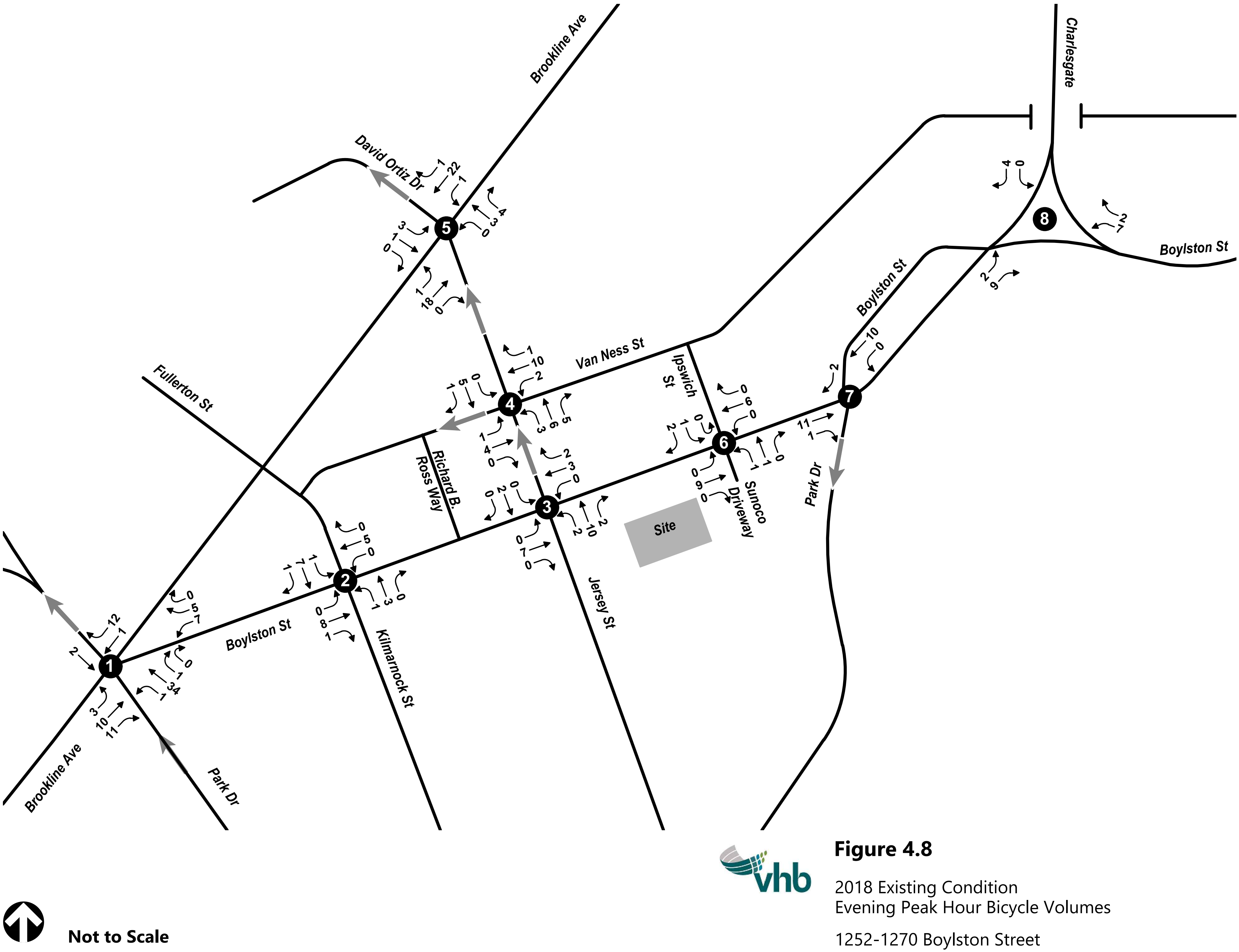


Figure 4.8

2018 Existing Condition
Evening Peak Hour Bicycle Volumes

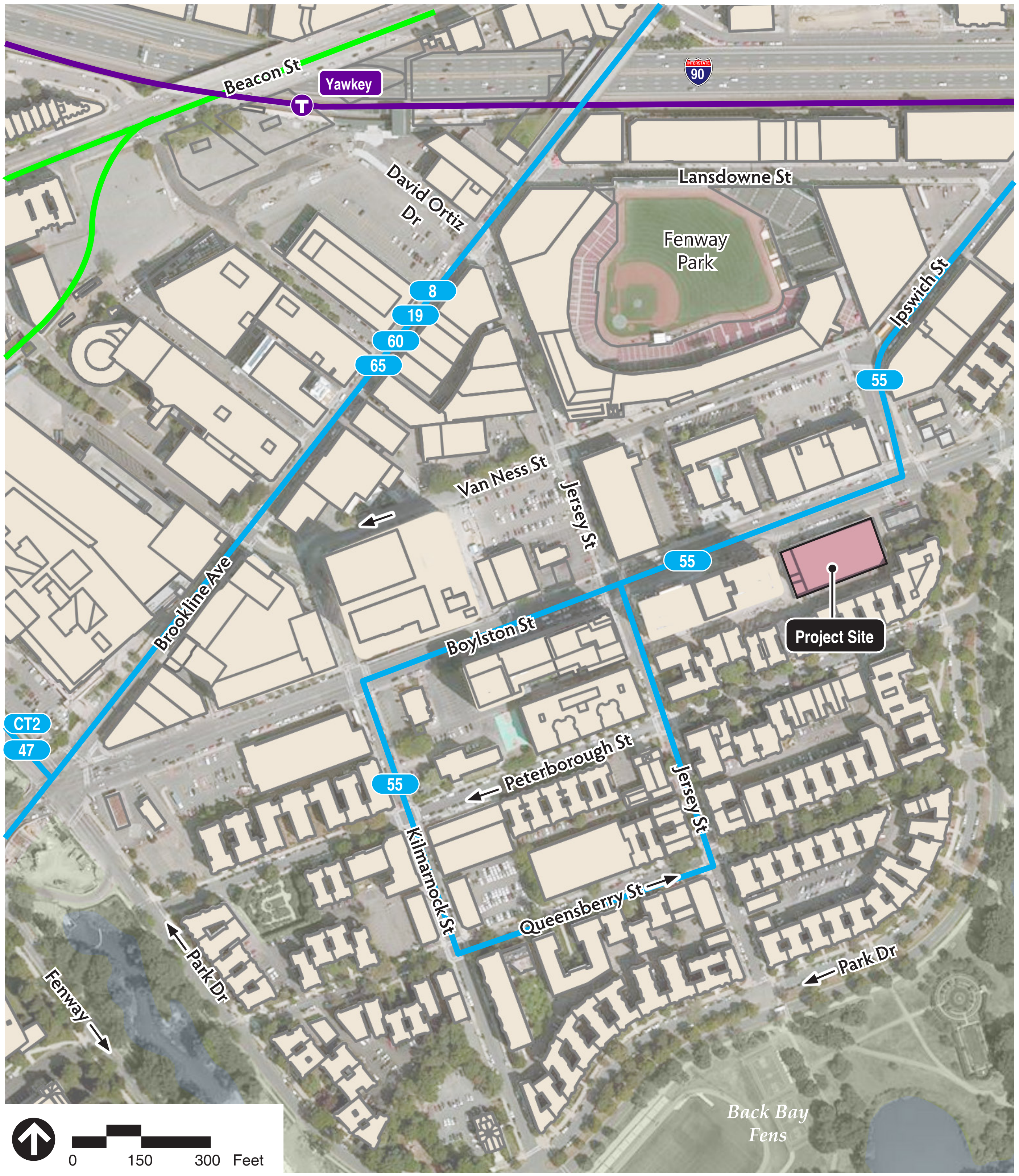
1252-1270 Boylston Street
Boston, Massachusetts

Source: ArcGIS Online Bing Aerial

Figure 4.9

Existing Bike and Car Share Stations

1252-1270 Boylston Street
Boston, Massachusetts

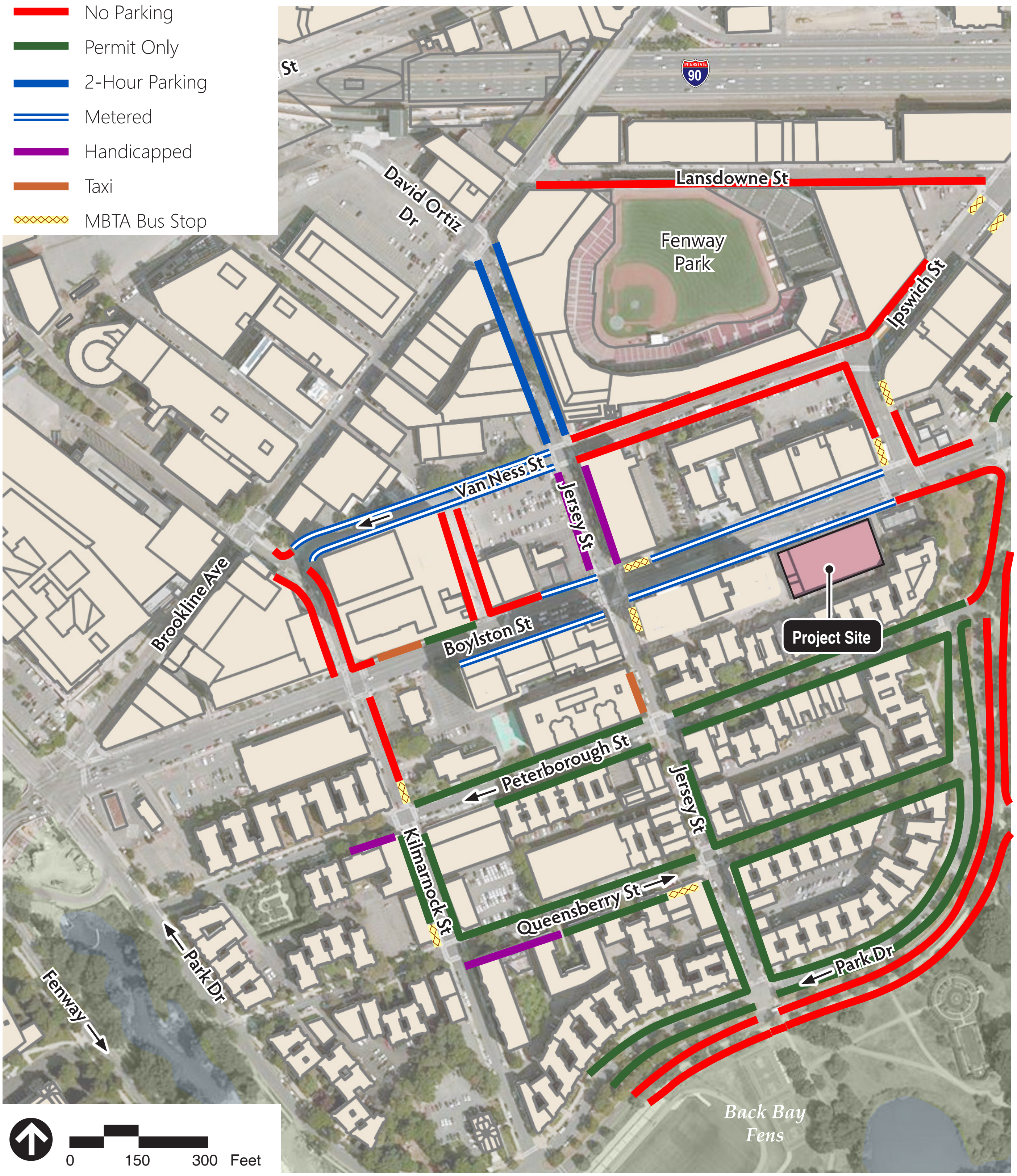


Source: ArcGIS Online Bing Aerial

Figure 4.10

Public Transportation

1252-1270 Boylston Street
Boston, Massachusetts



Source: ArcGIS Online Bing Aerial

Figure 4.11

Existing Curb Use

1252-1270 Boylston Street
Boston, Massachusetts

Source: ArcGIS Online Bing Aerial

Figure 4.12

Existing Off-Street Parking

1252-1270 Boylston Street
Boston, Massachusetts

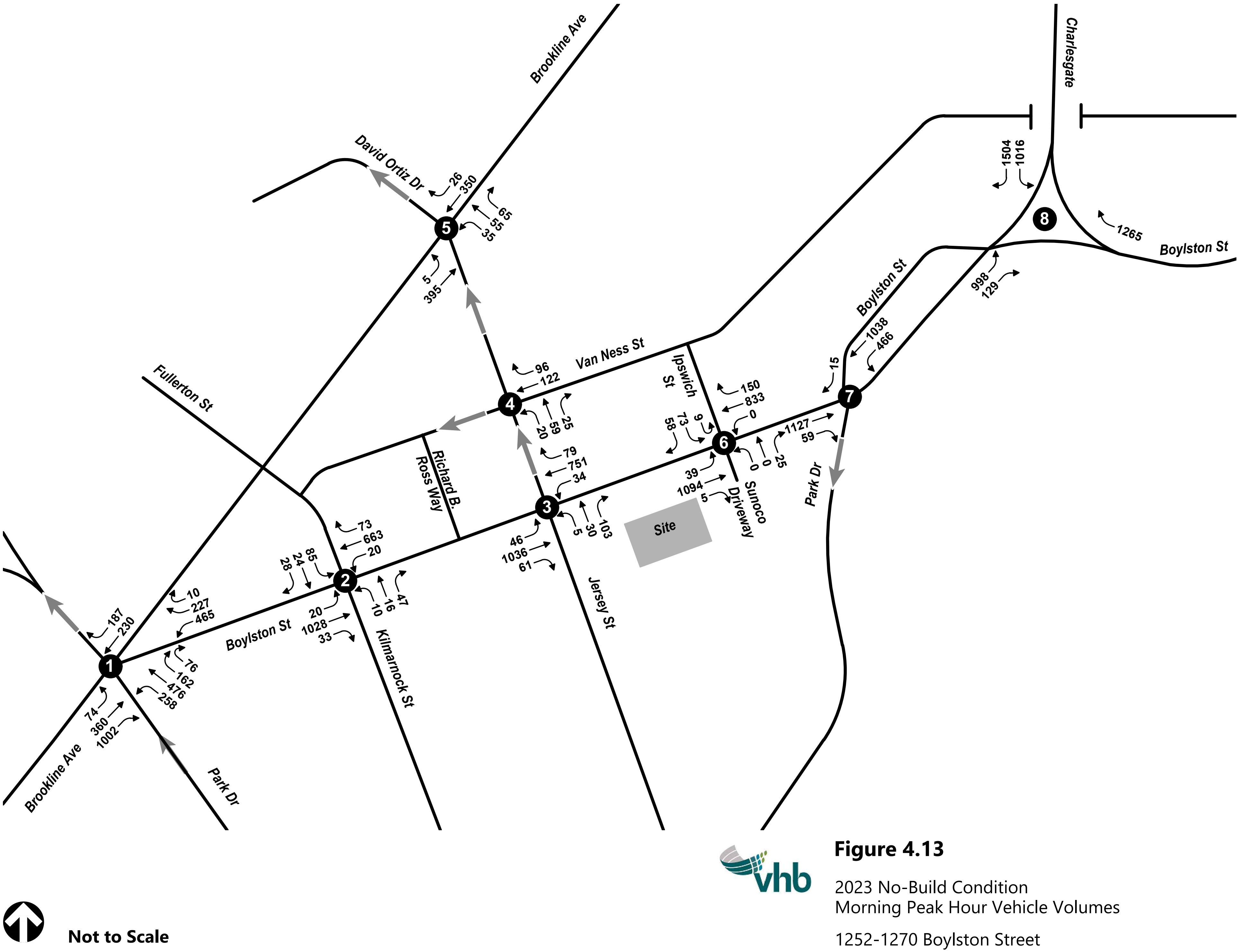


Figure 4.13

2023 No-Build Condition
Morning Peak Hour Vehicle Volumes

1252-1270 Boylston Street
Boston, Massachusetts

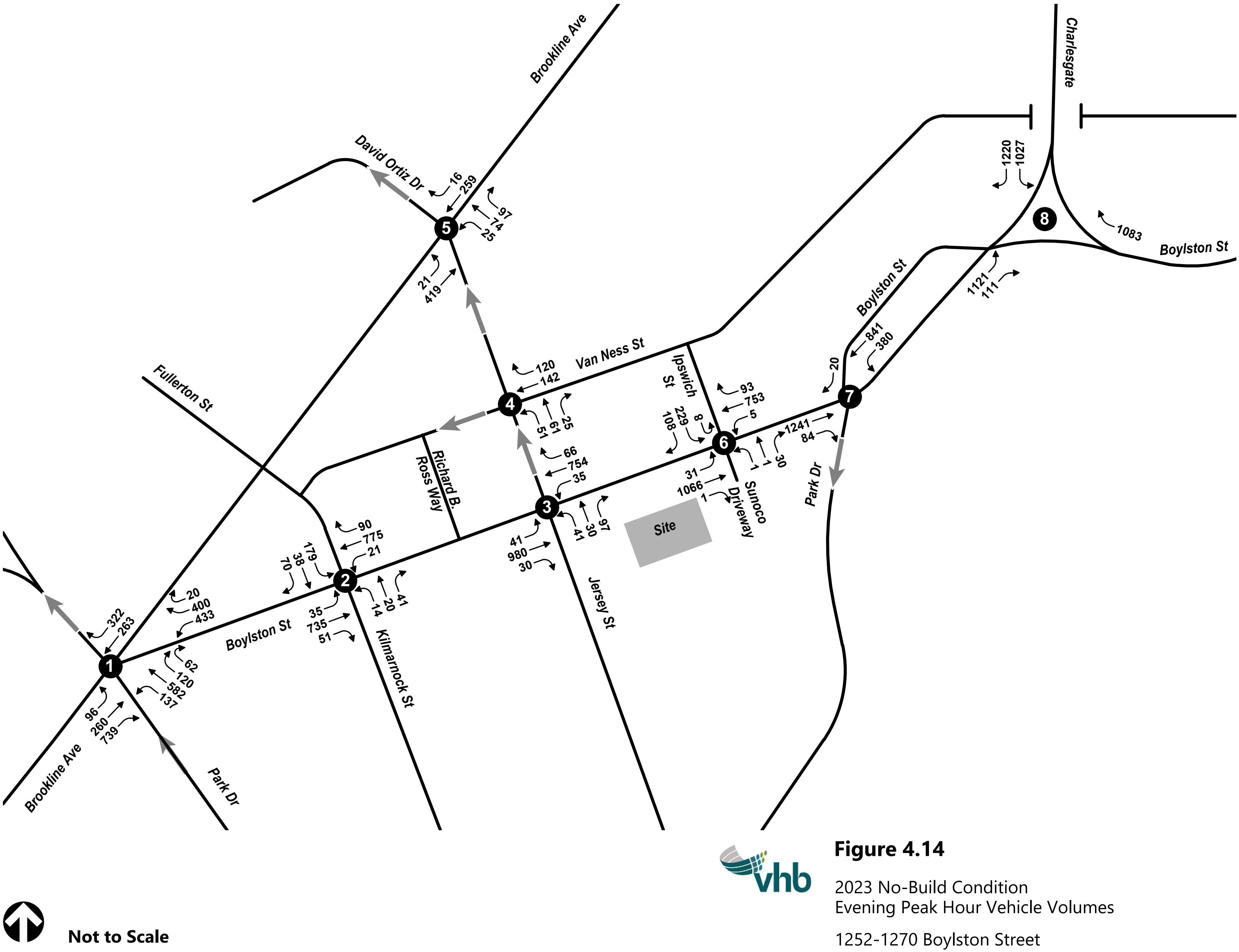
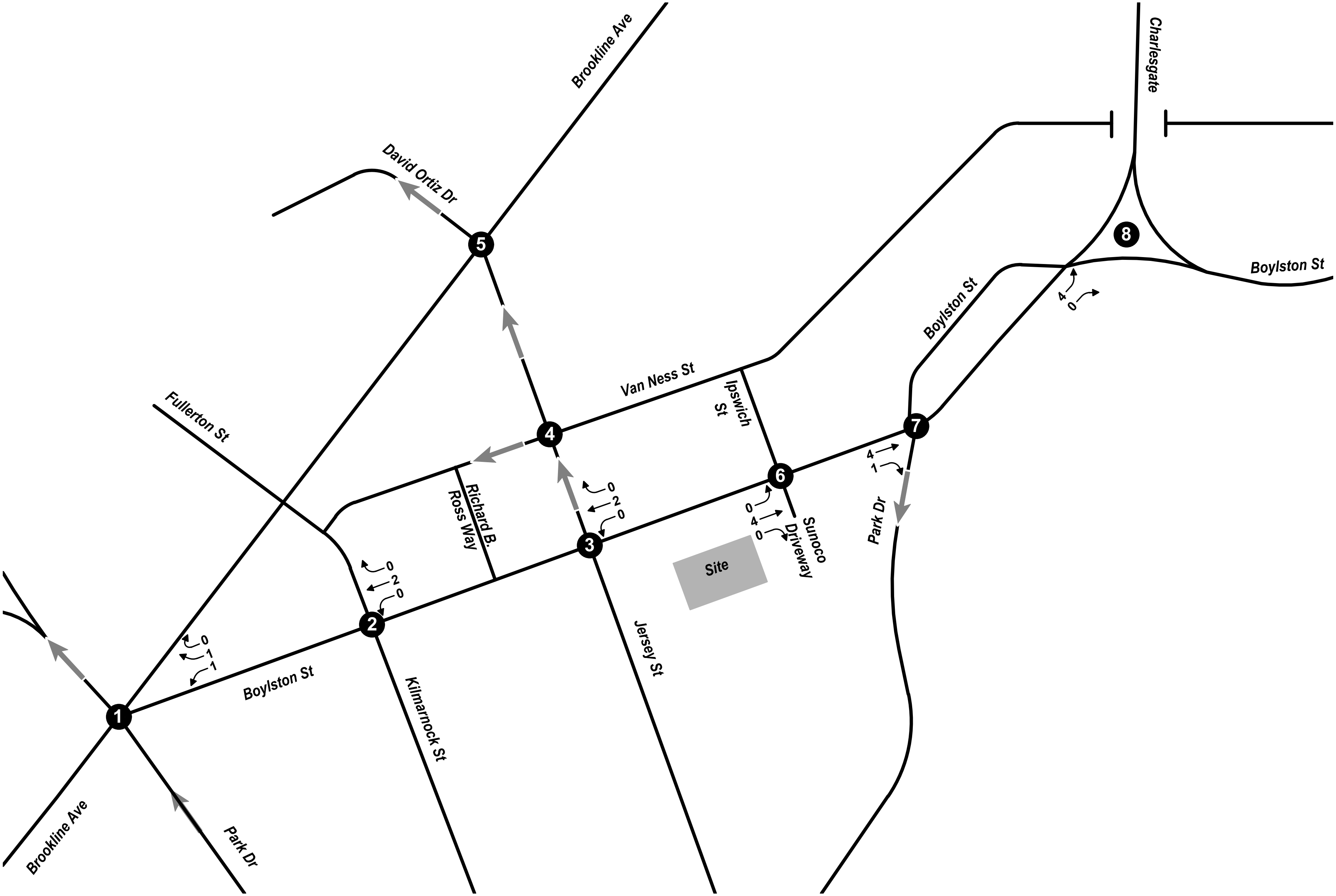


Figure 4.14

2023 No-Build Condition
Evening Peak Hour Vehicle Volumes

1252-1270 Boylston Street
Boston, Massachusetts



Not to Scale

Figure 4.15

Net New Project Generated Trips
Morning Peak Hour Vehicle Volumes

1252-1270 Boylston Street
Boston, Massachusetts

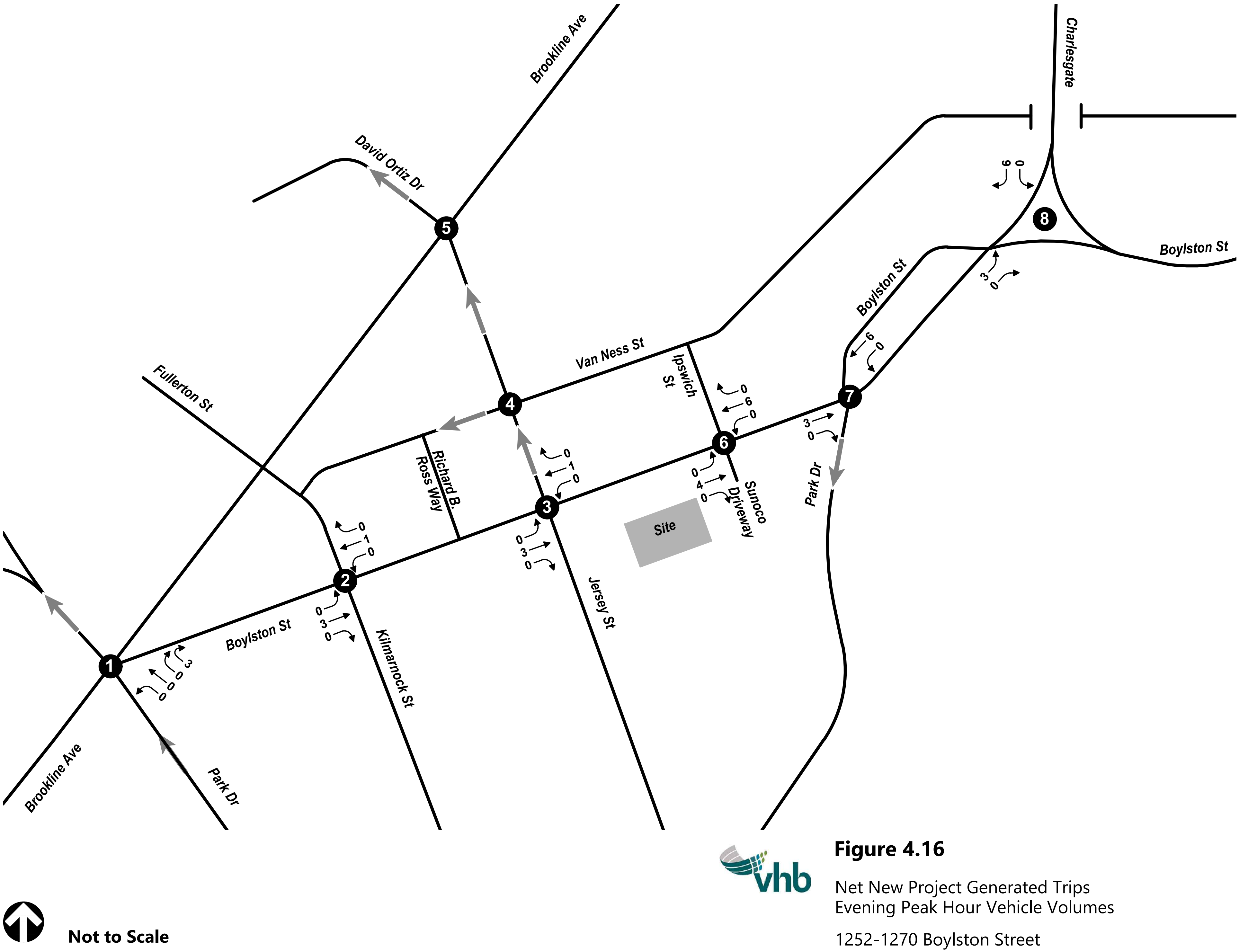


Figure 4.16

Net New Project Generated Trips
Evening Peak Hour Vehicle Volumes

1252-1270 Boylston Street
Boston, Massachusetts

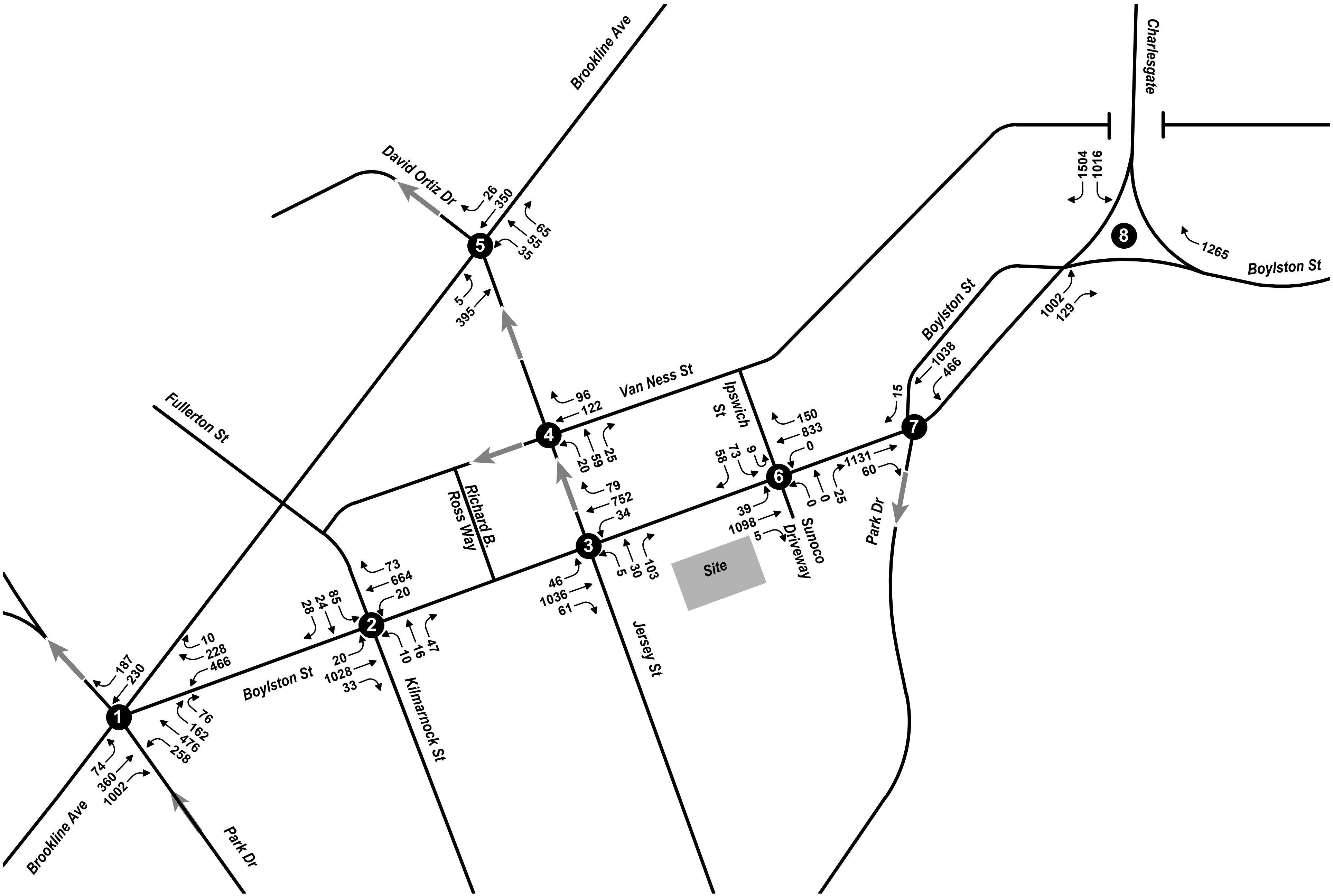
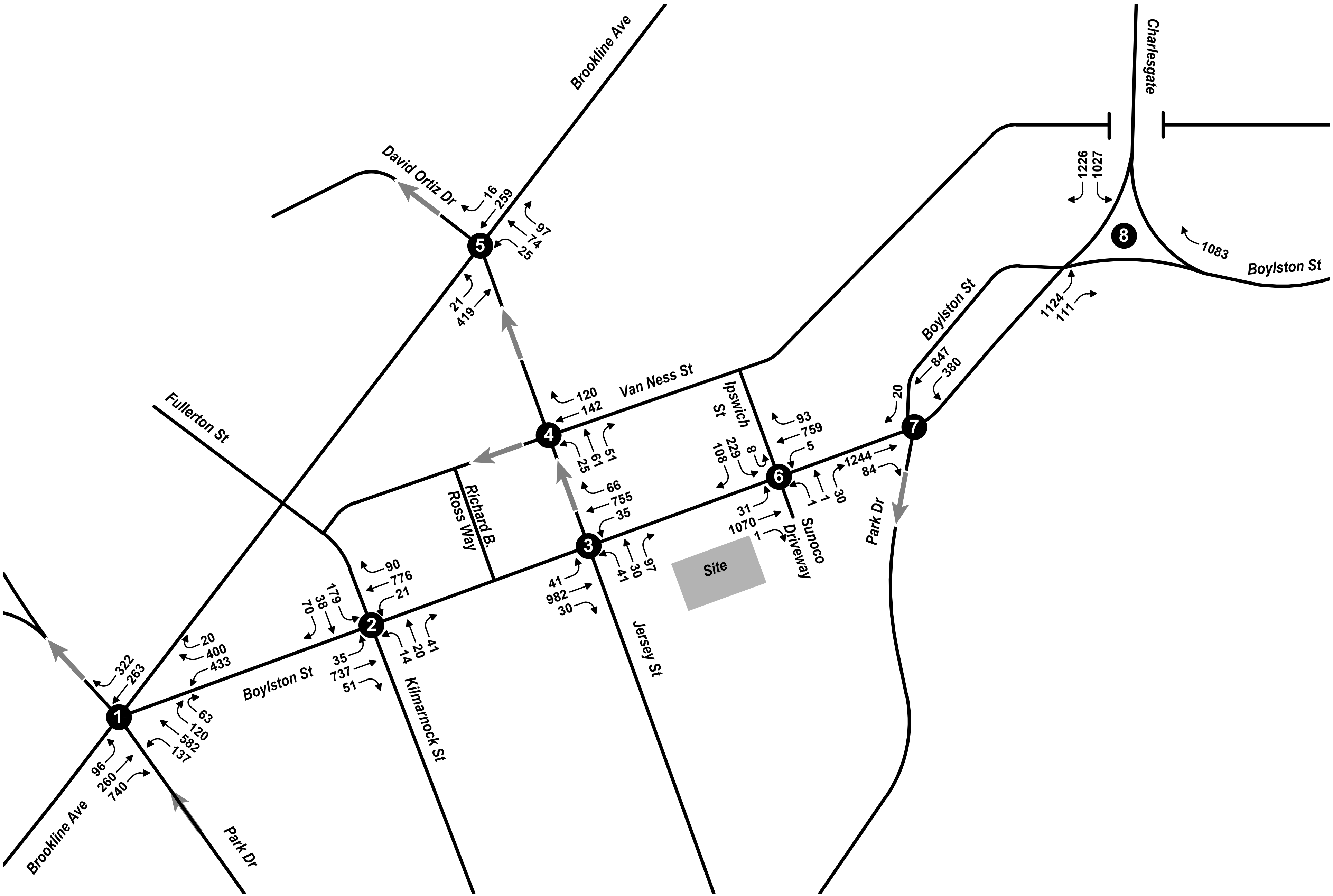


Figure 4.17

2023 Build Condition
Morning Peak Hour Vehicle Volumes

1252-1270 Boylston Street
Boston, Massachusetts



Not to Scale

Figure 4.18

2023 Build Condition
Evening Peak Hour Vehicle Volumes

1252-1270 Boylston Street
Boston, Massachusetts

5

Environmental Protection

This chapter presents information regarding the environmental conditions proximate to the Project Site and identifies any potential impacts. The Proponent will redevelop a currently underutilized site and deliver an improved program with enhanced efficiencies in comparison to the existing conditions at the Project Site. A primary objective of the Project is to achieve – and sustain – activation and connectivity across the Project Site to deliver an integrated pedestrian-realm public experience for the neighborhood. Through thoughtful design and programming – and per the analysis included in this chapter – the Proponent has endeavored to achieve this objective while minimizing and mitigating any potential adverse environmental impacts.

In compliance with the Article 80B Large Project Review guidelines of the Code, this chapter will address potential environmental impacts in the following categories:

- Wind
- Shadow
- Daylight
- Solar Glare
- Air Quality
- Water Quality
- Flood Hazard
- Noise
- Solid and Hazardous Waste
- Groundwater
- Geotechnical
- Construction

5.1 Summary of Key Findings and Benefits

The analysis of potential environmental impacts resulting from the Project include the following conclusions:

- **Wind** – The Project will not result in any new, unsafe pedestrian-level wind conditions in and around the Project Site and is expected to improve wind conditions in several locations.
- **Shadow** – Through meaningful articulation of the building facade and massing, as it transitions down the Boylston Street corridor towards the eastern end of the Project Site, shadow impacts have been minimized to the extent practicable to avoid noticeable effects on pedestrian use patterns. The Project was analyzed extensively to determine the least impactful orientation and height of the proposed structure.
- **Daylight** – The Project will result in a reduction in the visible skydome when viewed from the adjacent public ways compared to the existing conditions. These changes are consistent with the Project's urban context and the replacement of deteriorating two-story structures with new construction.

- **Solar Glare** – An analysis of the anticipated solar glare impacts indicates that the Project will potentially have infrequent, brief glare impacts, which will be minimized through building design. The Project will have no thermal impacts.
- **Air Quality** – The air quality analysis demonstrates that the Project will conform to the National Ambient Air Quality Standards and will not have a substantial impact on surrounding air quality.
- **Water Quality** – The Project will improve water quality by collecting and treating stormwater runoff through a series of structural BMPs. Subsurface infiltration systems, are intended to address phosphorus removal and promote groundwater recharge in accordance with GCOD requirements, as defined in Article 32 of the Code.
- **Flood Hazard** – The Project Site is not at risk of inundation from sea level rise during its design life (approx. 50 years, based on the industry standard), as it is not located within the 100-year floodplain.
- **Noise** – The Project is designed to comply with the City of Boston noise standards.
- **Solid and Hazardous Waste** – Asphalt pavement, brick, and concrete rubble generated from demolition of existing site driveways, parking areas, and buildings will be handled in accordance with applicable Massachusetts Department of Environmental Protection ("MassDEP") solid waste policies. The Proponent will retain a Licensed Site Professional to manage the environmental aspects of the Project, including proper management and removal of soil encountered during construction. Removal of excess excavated soil will be conducted in accordance with the current policies of the MassDEP.
- **Groundwater** – The Project Site is located within the GCOD. Therefore, the Project will include facilities to capture stormwater runoff and direct it to infiltration systems consistent with the requirement of Article 32, to the maximum extent practicable, with the goal of replenishing the groundwater table.
- **Geotechnical** – Project Site subsurface conditions consist of 5 to 10 feet of surficial fill underlain by organics, marine deposits, and glacial till, with bedrock at depth.
- **Construction** – The Project team will work to reduce potential construction period impacts, and a detailed CMP will be developed and submitted to BTD for their review and approval. The Proponent will share the CMP in advance with the public.

5.2 Wind

5.2.1 Methodology

The wind study involved wind simulations on a 1:300 scale model of the proposed building and surroundings. These simulations were conducted in RWDI's boundary-layer wind tunnel at Guelph, Ontario, to quantify local wind speed conditions and compare appropriate criteria for gauging wind comfort in pedestrian areas. A list of the drawings used for the construction of the model can be found in Appendix H.

The wind tunnel model included the proposed development and all relevant surrounding buildings and topography within a 1,200-foot radius of the Project Site. The mean wind speed profile and turbulence of the natural wind approaching the modelled area were also simulated in the wind tunnel. Wind speeds were measured for 36 wind directions, in 10-degree increments, starting from true north. The measurements at each of the 122 Sensor Locations were recorded in the form of ratios of local mean and gust speeds to the reference wind speed in the free stream above the model. These Sensor Locations were reviewed and approved by the BPDA prior to running the wind tunnel analysis.

The results were then combined with long-term meteorological data, recorded during the years 1990 to 2018 at Boston's Logan International Airport, to predict full scale wind conditions. The analysis combines seasonal findings that were performed separately for each of the four seasons and provides the annual results.

Wind Tunnel Analysis

A wind tunnel analysis was conducted for the following conditions:

› **No-Build Condition** – Based on guidance from the BPDA, this condition assumes future planned developments or background projects surrounding the Project Site.
› **Build Condition** – The No-Build Condition with the addition of the Project, as described in Chapter 1, *Project Description*.

The BPDA has adopted two standards for assessing the relative wind comfort of pedestrians. The first set of criteria is used by the BPDA to determine the acceptability of specific locations and is based on, *Criteria for Environmental Wind Conditions,* by W.H. Melbourne, in the *Journal of Industrial Aerodynamics*. 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, demonstrated in Table 5-1 below, are expressed in terms of benchmarks for the one-hour mean wind speed exceeding 1% of the time (i.e., the 99-percentile mean wind speed).

Table 5-1 BPDA Mean Wind Criteria*

Comfort Category	Mean Wind Speed (mph)
Dangerous	> 27
Uncomfortable for Walking	> 19 and ≤ 27
Comfortable for Walking	> 15 and ≤ 19
Comfortable for Standing	> 12 and ≤ 15
Comfortable for Sitting	≤ 12

* Applicable to the hourly mean wind speed exceeded 1% of the time.

The second criterion used by the BPDA is wind design guidance, which states that an effective gust velocity (hourly mean wind speed +1.5 times the root-mean-square wind speed) of 31 mph should not be exceeded more than 1% of the time.

The wind climate found in a typical downtown location in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares, and meets the BPDA effective gust velocity criterion of 31 mph. However, without any mitigation measures, this wind climate is likely to be frequently uncomfortable for more passive activities.

5.2.2 Pedestrian Wind Study Findings

Wind conditions that meet the effective gust criterion are predicted for the Build Condition. The following is a detailed discussion of the predicted mean wind speed conditions and effective gust conditions for the No-Build and Build Conditions within the public realm surrounding the Project Site.

Sensor Locations 1 through 7 are only present in the Build Condition. These Sensor Locations are covered by the existing building in the No-Build Condition whereas they are exposed in the Build Condition, due to the Project's set back along Boylston Street. Sensor Locations 89 to 103 are also not shown in the supporting figures, as these Sensor Locations are located on upper levels of the Project Site and are not part of the public realm.

No-Build Wind Conditions

The No-Build mean wind speed conditions and the No-Build effective gust speed conditions are demonstrated in Figures 5.1a and 5.1c, respectively. These figures demonstrate the baseline to which the Project is measured against.

Under the No-Build Condition, the mean wind speed conditions are Comfortable for Standing or Sitting around the majority of the Project Site; however, there are Uncomfortable locations in the alley west of the existing building.

The effective gust criterion is not met at two locations in the alley west of the Project Site – Sensor Locations 15 and 16 (demonstrated in Figure 5.1c).

Build Wind Conditions

The Build mean wind speed conditions and the Build effective gust speed conditions are demonstrated in 5.1b and 5.1d, respectively. These figures evidence that pedestrian-level wind conditions around the Project Site are expected to improve in several locations around the Project Site - Sensor Locations 17-20, 33, 35, 37, 39, 47, 63, and 86 - while remaining the same, or similar, at the other Sensor Locations. Specifically, there will be no change to mean wind speeds within the Back Bay Fens or Fenway Park.

At all Project entrances along Boylston Street, mean wind speed conditions are anticipated to be Comfortable for Sitting, Standing, and Walking, while other Sensor Locations around the Project Site will be expected to be Comfortable as well. All Sensor Locations are deemed Comfortable for Walking in the summer months.

Mean wind speed conditions in the alley west of the Project Site, at Sensor Locations 15 and 16, will improve during the summer months, while Sensor Location 34 will remain Comfortable. In the existing conditions, the alley conditions west of the Project Site are deemed Uncomfortable during the winter, late fall, and early spring and are predicted to remain Uncomfortable in the Build Condition. Additionally, while some increased wind activity is predicted to the east of the Project Site, at Sensor Locations 10, 56, and 57, increases are marginal.

Under the Build Condition, as demonstrated in Figure 5.1b, wind speeds are predicted to meet the effective gust criterion at all Sensor Locations tested, while it improves unacceptable wind gusts at Sensor Locations 15 and 16.

5.2.3 Impacts to Historic Resources

Regarding historic resources, there would be no perceptible change to mean wind speed conditions within Back Bay Fens to the east, as a result of the Project. Furthermore, the study demonstrates a measured decrease in mean wind speed conditions in the alley to the west of the Project Site and at the rear, along Private Alley 937. The rear side of the Project site faces the north elevation of the H.C. Stuart Apartment Building, located to the southwest of the Project Site.

The analysis shows no change in gusts that would impact historic resources in the vicinity of the Project Site.

5.3 Shadow

An analysis of the shading impact under the No-Build and Build Conditions is a requirement of the Article 80B Large Project Review process. The shading analysis was prepared in accordance with the requirements of Section B.2. of the BPDA Development Review Guidelines.

5.3.1 Methodology

A shadow impact analysis was conducted at specific time intervals to investigate the effect that the Project will have throughout the year, using a computer model of the Project and surrounding developed, urban areas. Several days and times were analyzed, as required under Article 80B Large Project Review. The analysis used "clear sky" solar data at Boston's Logan International Airport, assuming that no cloud cover ever occurs, therefore, providing a "worst case" scenario showing the full extent of when and where a shadow could occur.

In order to represent a variety of shadow conditions at various times of the day and times of the year, three time intervals (9:00 AM, 12:00 PM, 3:00 PM) are represented for the vernal equinox (March 21, see Figure 5.2a), summer solstice (June 21, see Figure 5.2b), autumnal equinox (September 21, see Figure 5.2c), and winter solstice (December 21, see Figure 5.2d). Per the BPDA Development Review Guidelines, 6:00 PM has been added to the June 21 and September 21 shadow studies. The study took into consideration Daylight Savings Time (DST), and therefore times are presented in Eastern Standard Time (EST) and Eastern Daylight Time (EDT). The study showed an existing shadow in and around the Project Site and the shadow impact of the Project.

The study focused on the shadow cast onto existing pedestrian areas, open spaces, and sidewalks adjacent to and near the Project Site.

Table 5-2 demonstrates the solar azimuth and altitude data. Times are listed as EST or EDT, as appropriate. The data reflects a latitude of 42.36º and a longitude of -71.06º.

Table 5-2 Solar Azimuth and Altitude Data

Date	Time	Azimuth *	Altitude **
March 21 EDT	9:00 AM	112.7	23.4
March 21 EDT	12:00 PM	161.2	46.2
March 21 EDT	3:00 PM	223.3	39.1
June 21 EDT	9:00 AM	93.5	39.9
June 21 EDT	12:00 PM	149.6	68.8
June 21 EDT	3:00 PM	246.3	56.5
June 21 EDT	6:00 PM	280.7	23.8
September 21 EDT	9:00 AM	115.4	26.0
September 21 EDT	12:00 PM	166.2	47.4
September 21 EDT	3:00 PM	227.2	37.3
September 21 EDT	6:00 PM	264.0	7.2
December 21 EST	9:00 AM	142.0	14.3
December 21 EST	12:00 PM	184.4	24.1
December 21 EST	3:00 PM	225.0	10.0

* Azimuth is measured in degrees clockwise from North
**Altitude is measured in degrees up from the horizon

5.3.2 Results

The incremental shadow produced is not expected to have any noticeable effect on pedestrian use pattern. The shadow is consistent with the existing urban shadow pattern and is moderate in relation to shadow cast by the taller structures surrounding the Project Site.

March 21 (Vernal Equinox)

March 21 is the vernal equinox and the daytime and nighttime hours are equal. The sun rises at 6:31 AM EDT in the southeastern sky and sets at 6:42 PM EDT. A net new shadow associated with the Project on March 21 is demonstrated on Figure 5.2a.

At 9:00 AM on the vernal equinox, a net new shadow from the Project will be cast to the northwest across Boylston Street and onto the neighboring properties to the north and the adjacent sidewalks. At both 12:00 PM and 3:00 PM, the Project will cast a minimal net new shadow to the north onto Boylston Street and the adjacent sidewalks, and east of the Project Site, respectively.

June 21 (Summer Solstice)

June 21 is the summer solstice and the longest day of the year. The sun rises at 5:08 AM EDT in the southeastern sky and sets at 8:25 PM EDT. A net new shadow associated with the Project for June 21 is illustrated in Figure 5.2b.

At 9:00 AM on the summer solstice, a net new shadow from the Project will be cast to the west onto Boylston Street and the adjacent sidewalks. At 12:00 PM, the Project will cast a minimal net new shadow to the north onto Boylston Street and the adjacent sidewalks. At 3:00 PM, small amount of a net new shadow will extend from the Project Site to the northeast onto the roof of the building located on the adjacent property.

At 6:00 PM, a shadow will be cast to the east of the Project Site onto the adjacent properties reaching a small portion of the Back Bay Fens. While the shadow will be perceptible in this area, the effect will be limited to sunset hours. This is not anticipated to have an effect that will diminish the integrity of the resource or the experience for visitors.

September 21 (Autumnal Equinox)

September 21 is the autumnal equinox and the daytime and nighttime hours are equal. The sun rises at 6:31 AM EDT in the southeastern sky and sets at 6:42 PM EDT. The shadow cast on this date is almost identical to those on March 21, the vernal equinox. A net new shadow associated with the Project on September 21 is depicted on Figure 5.2c.

At 9:00 AM on the autumnal equinox, a net new shadow from the Project will be cast to the northwest across Boylston Street and onto the neighboring properties to the north and the adjacent sidewalks. At 12:00 PM, the Project will cast a minimal net new shadow to the north onto Boylston Street and the adjacent sidewalks. At 3:00 PM, the Project will cast a minimal net new shadow to the northeast onto Boylston Street and the property located directly east of the Project Site. At 6:00 PM, a shadow will be cast to the east of the Project Site extending over the adjacent property to the east and over portions of the Back Bay Fens. While the shadow will be perceptible in this area, the effect will be limited to sunset hours. It is not anticipated to have an effect that will diminish the integrity of the resource or the experience for visitors.

December 21 (Winter Solstice)

December 21 is the winter solstice and the shortest day of the year. The sun is at its lowest inclination above the horizon at each hour of the day. Even low buildings cast long shadows in northerly latitudes, such as Boston. The sun rises at 7:10 AM EST and sets at 4:15 PM EST in December. The net new shadow associated with the Project on December 21 is depicted on Figure 5.2d.

At 9:00 AM on the winter solstice, the Project will cast a shadow in a northwestern direction filling in gaps in the already heavily shaded urban landscape extending over portions of building rooftops. At 12:00 PM, the Project will cast a shadow in a northern direction extending over a small section of Boylston Street and the neighboring properties' rooftops to the north of the Project Site. At 3:00 PM the surrounding area will be heavily shaded under the existing conditions where a net new shadow from the Project will extend northeast. An incremental net new shadow will be cast on adjacent existing building rooftops.

5.4 Daylight

The following section describes the anticipated effect on daylight coverage at the Project Site as a result of the Project. An analysis of the percentage of skydome obstructed under the No-Build and Build conditions is a requirement of Article 80B Large Project Review. The daylight analysis was prepared using the BPDA's Daylight Analysis Program ("BRADA") and completed in accordance with the requirements of Article 80B of the Code. The results of the daylight analysis are demonstrated in Figure 5.3.

5.4.1 Methodology

The daylight analysis was conducted using the BRADA program developed in 1985 by the Massachusetts Institute of Technology to estimate the pedestrian's view of the skydome taking into account building 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 this data, the model calculates the perceived skydome obstruction and provides a graphic depicting the analysis conditions.

The model inputs used for the study presented herein were taken from a combination of the BPDA's model data, an existing conditions survey, and schematic design plans prepared by the Project's architects. As described above, the BRADA software considers the relative reflectivity of building facades when calculating perceived daylight obstruction. Highly reflective materials are thought to reduce the perceived skydome obstruction when compared to non-reflective materials. For the purposes of this daylight analysis, the building facades are considered non-reflective, resulting in a conservative estimate of daylight obstruction.

Daylight Viewpoints

The following viewpoint was used for this daylight analysis:

- **Boylston Street** – This viewpoint is located on the centerline of Boylston Street, centered on the northern side of Project Site.

This point represents existing and proposed building facades when viewed from the adjacent public way.

5.4.2 Daylight Analysis Findings

Table 5-3 below demonstrates the percentage of skydome that is expected to be obstructed with and without the Project from the viewpoint. Figure 5.3 graphically demonstrates the Project-related daylight impacts from the viewpoint from Boylston Street.

Table 5-3 Existing / No-Build and Build Daylight Conditions

Viewpoint	Existing / No-Build Skydome Obstruction	Build Skydome Obstruction
Boylston Street	32.1%	63.1%

Upon completion of the Project, the viewpoint along the adjacent public way is expected to experience an increase in skydome obstruction.

5.5 Solar Glare

The BPDA Development Review Guidelines require projects undergoing Article 80B Large Project Review to analyze the potential impacts from solar glare on the following areas, in order to identify the potential for visual impairment or discomfort due to reflective spot glare:

› Potentially affected key roadways;

› Public open spaces; and

› Pedestrian areas.

Furthermore, projects must consider the potential for solar heat buildup in any nearby buildings receiving reflective sunlight from the Project, if applicable.

A detailed review of the potential impacts from Project-related solar glare are presented below.

5.5.1 Methodology

A computer model of the Project and surrounding urban area was developed using proprietary software called Eclipse (refer to the full solar glare study provided in Appendix H for additional information). Consistent with the wind and shadow methodologies, based on guidance from the BPDA, the solar glare study assumes future planned developments, or background projects, surrounding the Project Site. These future projects were based on the currently proposed building height and massing, which are subject to change.

Several receptor locations were utilized to understand the visual glare impacts on drivers, pedestrians, and building facades (refer to Figure 7 and Table 2 of the solar glare study provided in Appendix H for the receptor locations and descriptions).

The solar glare analysis used "clear sky" solar data at Boston's Logan International Airport and assumed no cloud cover ever occurs to provide a "worst case" scenario, showing the full extent of when and where glare could occur. Finally, a statistical analysis was performed to assess the frequency, intensity, and duration of the glare events. Reflections from existing structures were not accounted for; however, shadow from these structures is factored in.

Impact Criteria

- **Low:** Either no reflections reach the receptor, or reflections which do reach the location are unlikely to lead to visual or thermal concerns.
- **Moderate:** Some impacts have the potential for visual nuisance, minor thermal discomfort to people, or heating of materials. Moderate impacts do not indicate a significant safety risk and are common in urban areas and represent effects such as intermittent visual glare on pedestrians or occupants of adjacent buildings which can be safely self-mitigated.
- **High:** Indicates the potential for visual impacts to vehicle operators. When the sun is also in a driver's field of view, the brightness of the sun is expected to dominate over the less intense reflected light, likely reducing the perceived effect of high impact reflections.

5.5.2 Solar Glare Study Findings

Visual Glare

Moderate levels of visual impact are predicted to fall on various pedestrian and facade receptors studied in this analysis. These impacts are a temporary nuisance at worst and can be easily mitigated by briefly closing blinds or looking away from the glare source. No visual glare impact is predicted at the corner of Boylston Street and Jersey Street (receptor P14) or at Fenway Park (receptor P24).

Minimal locations which showed some reflection with a high visual impact potential were noted in the study. Specifically, a driver's experience could be altered when:

- Traveling west on Boylston St. approaching Park Dr. (receptor D1);
- Traveling west on Boylston St. approaching Ipswich St. (receptor D3); and
- Traveling south on Ipswich St. approaching Boylston St. (receptor D4).

The high impact reflections predicted at these locations on average last about 5 minutes but could last up to 20 minutes at one of the receptor locations. The majority of these impacts are infrequent and short in duration, and they occur during less than 0.7% of the daytime annually. In addition, while the sun is not directly within the westbound driver's field of view during impacts (receptors D1 and D3), this is due to the sun being shadowed by surrounding buildings rather than due to its position in the sky. The drivers would likely already be expecting a bright light source driving in that direction and have taken mitigation measures (i.e. lowering the sun visor, and / or putting on sunglasses).

Thermal Impacts

The study found that no significant thermal impacts are predicted at any of the study points (all points are rated as Low) as a result of the Project. Detailed results from the study can be found in Appendix H.

5.6 Air Quality

This section presents the evaluation of potential air quality impacts associated with the Project. The purpose of the air quality assessment is to demonstrate that the Project will not result in a violation of applicable local, state, and federal air quality standards. Boston, in Suffolk County, is in attainment for all National Ambient Air Quality Standards (NAAQS) criteria pollutants except for the 8-hour (1997 Revoked) and 1-hour (1979 Revoked) Ozone standards. The County is also in maintenance for carbon monoxide (CO). It also provides an evaluation of potential stationary sources associated with the Project and possible permits.

As described more fully in the sections below, the Project does not require quantitative analysis of mesoscale (regional) or microscale (localized, or "hot spot") air quality impacts because it does not meet or exceed the screening criteria established by the BPDA.

5.6.1 Mesoscale (Regional) Air Quality

The purpose of the mesoscale air quality analysis is to estimate the area-wide emissions of VOC and NOx during a typical day in the peak ozone season (i.e. summer) consistent with the requirements of the State Implementation Plan (SIP). The mesoscale air quality analysis evaluates the change in VOC and NOx emissions from average daily traffic volumes and vehicle emission rates. To demonstrate compliance with the SIP criteria, the air quality study must identify the change in daily (24-hour period) VOC and NOx emissions as a result of the Project.

The BPDA requires a mesoscale air quality analysis if a project produces 10,000 or more vehicle trips per day. Since the Project is not anticipated to generate over 10,000 or more vehicle trips per day, this analysis is not required.

5.6.2 Microscale (Localized) Air Quality

Per the Clean Air Act Amendments (CAAA), air quality control regions are classified and divided into one of three categories: attainment, non-attainment, and maintenance areas, depending upon air quality data and ambient concentrations of pollutants. The Project is in the Fenway neighborhood within the City of Boston, Suffolk County, Massachusetts, which, under the Environmental Protection Agency (EPA) designation, is a CO Maintenance Area. Projects located in a CO Maintenance Area are required to evaluate their CO concentrations with the NAAQS, as has been done for this Project. The City is in attainment for the remainder of the criteria pollutants.

The air quality study uses traffic data, such as volumes, delays, and speed. from the traffic study conducted for the Project. The BPDA Development Review Guidelines state that, for determination of potential CO impacts, "a microscale analysis predicting localized CO concentrations should be performed, including identification of any locations (intersections) projected to exceed the National or Massachusetts Ambient

Air Quality Standards." Based on the BPDA's criteria, the Project will not result in localized air quality impacts because:

- It will not cause a decline in overall LOS at any intersection in the study area in both the morning and evening peak hours (as demonstrated by the No-Build and Build conditions of Table 4-12). While two intersections would operate at LOS D in both the No-Build and Build scenarios, the Project will not substantially impact the operation of these intersections. The results of the traffic analysis indicate that the Project would result in less than a 0.2% increase in traffic volumes at these two intersections.
- It will not exceed 100 vehicles per hour during the peak periods. Instead, the Project is estimated to generate six vehicles in the morning peak hour and 14 vehicles in the evening peak hour. Additionally, the Project is only expected to increase traffic volumes at all study area intersections by less than 0.4%
- It will not generate 3,000 or more daily vehicle trips. The Project is projected to result in 256 weekday total daily vehicle trips (see Table 4-8).

Based on the microscale screening results discussed above, it has been determined that a quantitative CO hotspot analysis is not required for the Project.

5.6.3 Stationary Source Emissions and Permitting

Sizable combustion equipment (e.g. emergency generators and boilers) can have the potential to emit air pollutants at the Proposed Project and may be subject to air permitting under 310 CMR 7.00. MassDEP has established the Environmental Results Program (ERP) to streamline the certification process of smaller combustion equipment, subject to permitting regulations.

The exact sizes, makes, and models of equipment to be used by the Project are still to be determined and will be determined throughout the design process. However, equipment that is likely to be used at the Project, such as boilers or emergency generators, may be subject to permitting regulations. If a boiler with a rated capacity between 10 to 40 MMBtu per hour is used on the Project Site, the Proponent will submit the appropriate self-certification forms under the ERP process before the installation of the boiler. Additionally, if an emergency generator with a rated capacity equal to or greater than 37 kW is used on the Project Site, the Proponent will submit the appropriate self-certification forms under the ERP process within 60 days of generator startup. During the ERP process, the stationary sources will be required to show compliance with all applicable air quality regulations, including the NAAQS, to ensure public health and safety.

5.7 Water Quality

The Project will comply with the MassDEP Stormwater Management Standards, while improving the quality of stormwater runoff from the Project Site and reducing its quantity compared to existing conditions. The Project will improve water quality by collecting and treating stormwater runoff through a series of structural BMPs, designed to remove oil, floatables, and Total Suspended Solids. Clean runoff from the Project Site will be directed to recharge systems that are designed to infiltrate stormwater runoff to replenish groundwater and provide phosphorous removal. Subsurface infiltration systems, if constructed, are intended to address phosphorus removal and promote groundwater recharge in accordance with GCOD requirements, as defined in Article 32 of the Code. Section 6.2.2 of Chapter 6, *Infrastructure*, provides a complete description of the existing and proposed stormwater management systems and provides a summary of the Project's compliance with the MassDEP Stormwater Management Standards.

5.8 Flood Hazard

The Project Site is not at risk of inundation from sea level rise during its design life (approx. 50 years, based on the industry standard). As referenced in section 3.5.1 and demonstrated in Figure 3.2, the Project Site is not located within the 100-year floodplain. Section 3.5 of Chapter 3, *Sustainability / Green Building Design and Climate Change Resiliency,* provides a more in-depth discussion of sea level rise and extreme flooding.

5.9 Noise

The noise assessment evaluated the potential noise impacts associated with the Project's proposed building design and activities, including mechanical equipment and loading activities. This section discusses the fundamentals of noise, noise impact criteria, noise analysis methodology, and potential noise impacts.

The analysis demonstrates that the Project will comply with City's noise regulations and the noise goals of the United States Department of Housing and Urban Development (HUD). Based on preliminary design, the Project's operations will have no adverse noise impacts at nearby sensitive receptor locations.

5.9.1 Fundamentals of Noise

Noise is defined as unwanted or excessive sound. Sound becomes unwanted when it interferes with normal activities such as sleep, communication, work, or recreation. How people perceive sound depends on measurable physical characteristics, which include the following:

- Intensity - Sound intensity is often equated to loudness.
- Frequency - Sounds are comprised of acoustic energy distributed over a variety of frequencies. Acoustic frequencies, commonly referred to as tone or pitch, are typically measured in Hertz. Pure tones have all their energy concentrated in a narrow frequency range.

Sound levels are most often measured on a logarithmic scale of decibels (dB). The decibel scale compresses the audible acoustic pressure levels which can vary from the threshold of hearing (0 dB) to the threshold of pain (120 dB). Because sound levels are measured in dB, the addition of two sound levels is not linear. Adding two equal sound levels creates a 3 dB increase in the overall level. Research indicates the following general relationships between sound level and human perception:

› A 3 dB increase is a doubling of acoustic energy and is the threshold of perceptibility to the average person.
› A 10 dB increase is a tenfold increase in acoustic energy but is perceived as a doubling in loudness to the average person.

The human ear does not perceive sound levels from each frequency as equally loud. To compensate for this phenomenon in perception, a frequency filter known as A-weighted (dB(A)) is used to evaluate environmental noise levels. Table 5-4 demonstrates a list of common outdoor and indoor sound levels.

Table 5-4 Common Outdoor and Indoor Sound Levels

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

Source: Highway Noise Fundamentals. Federal Highway Administration, September 1980.
* μPA – MicroPascals, which describe pressure. The pressure level is what sound level monitors measure.
** dB(A) – A-weighted decibels, which describe pressure logarithmically with respect to 20 μPa (the reference pressure level).

A variety of sound level indicators can be used for environmental noise analysis. These indicators describe the variations in intensity and temporal pattern of the sound levels. The following is a list of common sound level descriptors used for environmental noise analyses:

- L90 is the sound level which is exceeded for 90% of the time during the time period. L90 is generally considered to be the ambient or background sound level.
- Leq is the A-weighted sound level, which averages the background sound levels with short-term transient sound levels and provides a uniform method for comparing sound levels that vary over time.

5.9.2 Methodology

An October 2018 noise analysis, conducted by Acentech, evaluated the potential noise impacts associated with the Project's operations, which include mechanical equipment and loading / service activities. The noise analysis included measurements of existing ambient background sound levels and an evaluation of potential noise impacts associated with the proposed mechanical equipment (e.g. cooling towers, energy recovery units, and emergency generator) and loading activities. The study area was evaluated and sensitive receptor locations near the Project Site were identified and examined. The Project's layout and building design, as it relates to the loading area and management of deliveries were also considered. The analysis considered sound level reductions due to distance, proposed building design, and obstructions from surrounding structures. The anticipated mechanical equipment associated with the Project are located on the rooftop of the proposed building.

In addition, the noise study includes an assessment of potential impacts on the proposed residential use. The assessment utilized the HUD noise goals and guidelines outlined in section 51.103 of, *The Noise Guidebook*.

Receptor Locations

The noise analysis included an evaluation of the study area to identify nearby sensitive receptor locations, which typically include areas of sleep and areas of outdoor activities. The noise analysis identified the nearest sensitive receptor locations, which include two residential building that are located adjacent to the Project. As demonstrated on Figure 5.4, the receptor locations include the following:

- R1 – Viridian residential building to the west on Boylston Street; and
- R2 – Residential neighborhood to the south / southeast on Peterborough Street.

These receptor locations, selected based on land use considerations, represent the most sensitive locations near the Project Site.

5.9.3 Noise Impact Criteria

The City and HUD have developed noise impact criteria that establish noise thresholds deemed to result in adverse impacts. The noise analysis for the Project compared existing and future sound levels to these criteria and determined whether the Project will generate noise impact at sensitive receptor locations near the Project or be impacted by the existing noise environment.

5.9.3.1 City of Boston Noise Impact Criteria

The noise analysis for the Proposed Project used these standards to evaluate whether the Proposed Project will generate sound levels that result in potential adverse impacts based on the City criteria.

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

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).

Table 5-5 City of Boston Noise Standards by Zoning District, dB(A)

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

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

5.9.4 Existing Noise Conditions

Noise measurements were conducted to establish existing ambient sound levels in vicinity of the Project Site. The noise monitor was located on the roof of 1252-1268 Boylston Street. Continuous measurements were conducted from September 14, 2018 to September 18, 2018 to capture sound levels representative of typical existing daytime and nighttime ambient conditions. The existing measured sound level data are summarized in Figure 5.5a.

The measured L90 sound levels range from approx. 53 dB(A) to approx. 66 dB(A) during the daytime period (7:00 AM to 11:00 PM) in the vicinity of the Project Site. During the nighttime period (11:00 PM to 7:00 AM), the area surrounding the Project Site experience sound levels ranging from approx. 51 dB(A) to approx. 65 dB(A). The result of the noise monitoring indicates that sound levels in the area of the Project Site are currently above the City's standards for a Residential District during certain periods of a typical day. The Project Site is located in an active urban area with vehicular traffic noise dominating the ambient noise levels during the daytime period.

The nighttime period sound levels were generally associated with vehicular traffic on the local roadways and noise from mechanical equipment from nearby buildings.

5.9.5 Future Noise Conditions

The noise analysis assessed the potential noise impacts associated with the Project's mechanical equipment and loading activities. The analysis also evaluated the potential sound level impacts at the nearby sensitive receptor locations and the proposed residential uses of the Project. The existing measured sound level data as well as the predicted sound levels are demonstrated in Figure 5.5b.

Mechanical Equipment

Since the Project is in the early stages of the design process, the specific details related to the final selection of mechanical equipment are not confirmed at the time of this noise assessment. Based on preliminary design plans, the anticipated mechanical equipment associated with the Project may include the following:

- Cooling towers;
- Energy recovery units; and
- Emergency generators.

A quantitative analysis was conducted for the external rooftop equipment using the manufacturer's specifications. The reference sound level data for the rooftop mechanical equipment were analyzed using the industry accepted noise modeling program called CadnaA. The sound levels associated with the equipment were assumed to be operating at full load and were projected to the receptor locations using the properties of sound propagation following the ISO 9613 methodology, A*ttenuation of sound during propagation outdoors-Part: 2" International Organization for Standardization*. These sound levels were adjusted to reflect the distances to the sensitive receptor locations, propagation path, and applicable blockages (such as building facades). The calculated sound levels, demonstrated in Table 5-6, represent the exterior sound levels at the nearby sensitive receptor locations.

Table 5-6 Future External Sound Levels, dB(A)

Receptor Location	Project-Generated Sound Levels
R1: Viridian Apartments	48
R2: Peterborough Street Apartments	39

Source: SCAPE Site Environmental Noise Assessment, Acentech, October 25, 2018.
Note: Refer to Figure 5.4 for receptor locations.

The Project-generated sound levels are anticipated to be the same during both daytime and nighttime periods, due to equipment operating at full load continuously throughout daytime and nighttime periods. As demonstrated in Table 5-6 above, the overall Project-generated sound levels attributed to the rooftop equipment ranges from approx. 39 dB(A) to 48 dB(A) at the nearby sensitive receptor locations. These

Project-generated sound levels are below the City daytime and nighttime standards of 60 dB(A) and 50 dB(A), respectively, for a residential zone.

Furthermore, the Project is anticipated to include an emergency generator for life safety purposes, such as exit lighting during an emergency. MassDEP's regulations require such equipment to be certified and registered when installed. As part of the permitting process, the Project will demonstrate compliance with additional MassDEP regulations under the Code of Massachusetts Regulations (310 CMR 7.00). During the construction phase, the Proponent will submit a permit application to MassDEP, which may include noise mitigation measures, such as acoustic enclosures and exhaust silencers, to meet MassDEP's noise criteria.

Service and Loading Activities

Daily loading and service activities associated with the Project will include an indoor trash compactor and exterior loading dock for deliveries. The trash compactor will be located on the ground floor, set back in the building with access from the rear side of the building and operate during daytime hours. The loading dock only allows access for one truck and will also be in use during daytime hours. The loading activities will be managed so that service and loading operations do not impact traffic on the adjacent roadways. Since the service and loading activities will be enclosed and managed by Scape-employed staff, potential noise impacts to nearby sensitive receptor locations are anticipated to be negligible.

Impacts on Proposed Residential Use

Conformance with HUD interior design noise level is a requirement for applicable residential projects under the BPDA Development Review Guidelines. HUD generally requires a noise assessment for residential projects that are located within:

- 1,000 feet of major roadways;
- 3,000 feet of railroads; and
- 15 miles of airports.

The Project is located in an active, urban area close to major transportation facilities. Specifically, it is located within 1,000 feet of the Massachusetts Turnpike ("I-90") and approx. four miles from Logan Airport.

HUD uses a day-night average sound level (DNL or Ldn) as the value for establishing goals for determining acceptable sound levels. The DNL levels are based on a multitude of factors and provides a noise indicator of a 24-hour weighted average sound level. The DNL is derived from hourly sound level values and includes a nighttime penalty that accounts for increased annoyance during these hours. Studies have shown that additional annoyance occurs during the nighttime, since background sound levels are typically at their minimum and many people are noise sensitive while trying to sleep.

HUD considers a DNL of 65 dB(A) or lower as an acceptable exterior sound level and 45 dB(A) as an acceptable interior goal. Exterior sound levels above 65 dB(A) but not exceeding 75 dB(A) is normally unacceptable. Residential buildings are generally constructed such that the walls are expected to reduce the outdoor sound levels by a minimum of 20 dB(A).

Sound level data from the noise measurements were used to assess the potential conditions that would be experienced by the proposed residential use. The measured sound levels encompass all noise sources impacting the Project Site, including I-90, MBTA rail lines, and Logan Airport. Due to the proximity of the Project Site to Fenway Park, ambient noise levels can vary greatly depending on major event days. As such, measurements were conducted during a period when Fenway Park was active with a baseball game. The measured sound levels ranged from 65 dB(A) to 70 dB(A) during both daytime peak hours and weekend evening hours while activities occurred at Fenway Park. As HUD's interior noise level goal is a Ldn of 45 dB(A), the Project will incorporate construction materials and techniques to reduce interior noise levels consistent with HUD's interior noise level goal. According to the Acentech study, building design consisting of 1" IGU with ¼" lites, ½" airspace between lites, and associated facade and framing elements is expected to reduce the noise exposure to approx. 40 dB(A) which is below HUD's interior noise level goal. The glazing and associated framing system will be designed to control sound levels transmitted from the exterior to the interior of the residential units. The proposed residential units may experience even lower interior sound levels when there are no activities occurring at Fenway Park.

5.9.6 Conclusion of Noise Impact Assessment

The noise analysis determined that the sensitive receptor locations near the Project Site currently experience sound levels above the City's noise standards. Based on preliminary design, the Project's operations will generate sound levels below the City's noise standards and have no adverse noise impacts at nearby sensitive receptor locations. Additionally, during the design of the Project's residential units, selection of building materials and construction techniques will be considered to minimize interior noise levels in the residential units onsite, consistent with HUD's interior noise level goal.

5.10 Solid and Hazardous Wastes

This section discusses existing contamination and solid and hazardous waste conditions on the Project Site.

5.10.1 Project Site History and Compliance with Massachusetts Contingency Plan

Based on available records, the Project Site was undeveloped prior to 1919. From 1919 until at least 1957, records indicated that the Project Site was utilized as an automotive sales and service center with shops along the front of Boylston Street. The existing building located on the 1270 Boylston Street parcel was originally built for a catering company. A variety of retail and commercial uses were listed to occupy the Project Site from at least 1951 to 2002. City records indicate that these uses included a bowling alley, restaurants, service and distribution centers for heating equipment and computers, and a travel agency.

Currently, the Project Site is partially occupied by retail and commercial uses, while there is also a large amount of vacant space. It is bound to the east by a Sunoco gas station, located at 1250 Boylston Street.

The Project Site is not a MassDEP Massachusetts Contingency Plan (MCP) listed release site, but the adjacent 1250 Boylston Street property is the location of three MCP disposal sites referenced as Release Tracking Numbers (RTN) 3-1956, RTN 3-22171, and RTN 3-33089. All three RTNs are related to releases of petroleum compounds to soil and groundwater.

5.10.2 Solid and Hazardous Waste

Asphalt pavement, brick, and concrete (ABC) rubble generated from demolition of driveways, parking areas and buildings will be handled in accordance with applicable MassDEP solid waste policies. The Project's disposal contracts will include specific provisions for the segregation, reprocessing, reuse, and / or recycling of building materials and demolition debris. Those materials that cannot be reused onsite will be transported in covered trucks to an approved solid waste facility, per applicable MassDEP solid waste policies.

Abatement and disposal of hazardous materials or waste, if encountered, will be performed under the provisions of MGL c21 / 2C, OSHA, and the MCP by specialty contractors experienced and licensed in handling materials of this nature.

It is currently anticipated that construction of the Project and Project Site improvements will require excavation and offsite removal of an unknown quantity of excess soil. The Proponent will retain a Licensed Site Professional to manage the environmental aspects of the Project, including proper management and removal of soil encountered during construction. Removal of excess excavated soil will be conducted in accordance with the current policies of the MassDEP. Chemical testing of soil samples will be performed as needed, to reuse / dispose of the soils offsite, depending on the acceptance criteria of specific facilities. The soils transported off-site will be legally reused / disposed of in accordance with the MCP and other regulatory requirements. Disposal of materials will be tracked via Material Shipping Records, Bills of Lading, and / or other methods, as required to ensure their proper and legal disposal.

In addition, procurement of temporary groundwater dewatering discharge permits from the EPA, MassDEP, BWSC, and / or Massachusetts Water Resources Authority will be required for pumping and discharge of Project Site groundwater from within the temporary excavation support system to be installed prior to excavation.

5.11 Groundwater

Groundwater levels in the vicinity of the Project Site are expected to be at depths ranging from 5 to 10 feet below ground surface, corresponding to about Elevation +10 to Elevation +6 BCB. Based on previous reports prepared by others, groundwater gradient at the Project Site is likely in an east-southeasterly direction. It is anticipated that future groundwater levels across the Project Site may vary from those reported herein, due to factors such as normal seasonal changes, periods of heavy precipitation, and alterations of existing drainage patterns.

5.12 Geotechnical

5.12.1 Subsurface Soil Conditions

Based on the available subsurface data, ground surface is anticipated to be underlain by an approx. 5 to 16-foot thickness of granular fill overlying an approx. 7 to 10-foot thick organic deposit. Underlying the organic deposit, a compact to very dense alluvium sand deposit ranging from about 9.5 to 11.5 feet in total thickness is anticipated to be present and be underlain by a thick deposit of marine clay that extends to about 123 feet below ground surface. Below the marine clay deposit, an approx. 40-foot thick, very soft to stiff glaciomarine deposit is anticipated. A dense deposit of glacial till and bedrock are anticipated to underlie the glaciomarine deposit at depths of approx. 165 feet below ground surface.

5.12.2 Foundation Design and Construction

Based on the proposed scope of the Project, and the anticipated subsurface conditions described above, it is anticipated that the Project will be founded on the existing outwash deposit with a foundation system consisting of a waterproofed structural mat foundation.

The Project may include below-grade levels which are benched into the Project Site. Construction of the foundations and below-grade parking structure will require excavation depths anticipated to be up to 30 feet below the Boylston Street ground surface (approx. Elevation +19 BCB). The below-grade levels will be waterproofed.

Excavation will be conducted within an engineered lateral earth support system, such as a steel sheet pile wall system, which will be designed to provide excavation support, limit ground movements outside the excavation to protect adjacent facilities, and maintain groundwater levels outside the excavation by creating a groundwater "cutoff" between the excavation and the surrounding area. The lateral earth support system will be designed to be installed into the clay stratum to isolate the excavation and future below-grade garage from the groundwater table. Due to the depth of excavation, the lateral earth support system will be supported by an internal bracing system or external bracing system such as tiebacks. Pre-excavation will be performed along the building perimeter to remove obstructions prior to installing the excavation support system.

5.13 Temporary Construction Impacts

Most construction activities will be accommodated within current Project Site boundaries. Details of the overall construction schedule, work hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in the (CMP) to be filed with BTD in accordance with the City's transportation maintenance plan requirements.

5.13.1 Air Quality

No adverse air quality impacts from the construction of the Project are anticipated. Fugitive dust mitigation measures may include, as necessary:

- Providing wet suppression to minimize the generation of dust from excavation operations and onsite vehicle traffic, with provisions for any runoff control;
- Spraying any piles of excavation materials with soil cement or calcium chloride overnight and on weekends, and securely covering long-term material stock piles;
- Compacting of the soil or the use of gravel to stabilize the Project Site access points;
- Washing vehicle wheels before leaving the Project Site, as necessary, with provisions for runoff control;
- Periodic cleaning of paved streets near the entrances to the Project Site to minimize vehicle mud / dirt carryout;
- Installing fencing around the perimeter of the Project Site to assist in containing wind-blown dust;
- Requiring that trucks hauling excavated material from the Project Site install secure covers over their loads; and
- Encouraging the construction contractors for the Project to implement the Massachusetts Diesel Retrofit Program control measures for heavy-duty diesel equipment.

5.13.2 Noise

Construction noise levels are proposed to be mitigated to the greatest extent possible. The construction activity associated with the Project may temporarily increase nearby sound levels due to the use of heavy machinery. Heavy machinery is expected to be used intermittently throughout the Project's construction phases, typically during daytime periods. The construction activities that will generate the highest sound levels may include demolition, site excavation and grading, and construction of the foundation for the proposed building.

The construction of the Project will be performed in a manner that complies with the MassDEP and City noise regulations. To ensure compliance with these regulations during construction, the Proponent, to the extent practicable, will seek to incorporate into the general construction contract the following mitigation measures:

- Limited vehicle idling to five minutes;
- Limited construction vehicle warm-up to ten minutes;
- Enforced ambient leveling sensors on the back up alarms of construction vehicles;
- Installed noise muffler systems on construction equipment; and
- Limited hours of construction, based on City regulations.

5.13.3 Traffic

To minimize impacts to abutters and the local community, the Proponent will consider all available measures, including information on construction activities, specific construction mitigation measures, and construction materials access and staging area plans. Construction fencing and barriers, walkways, lighting, and signage will be used to ensure public safety throughout the construction period.

Refer to Section 4.9 of Chapter 4, *Transportation,* for additional detail on construction management relative to traffic and roadway access.

5.13.4 Odor

Odor issues are not anticipated due to the lack of organic soils on the Project Site; however, if such soils are encountered, the Project team will undertake appropriate mitigation measures to control the odor associated with their removal, such as:

- Cut and cover utility trenches whenever possible;
- Protection of excavated materials with plastic sheathing to encapsulate odors; and
- Removal of excavated materials from the Project Site in a covered vehicle on a frequent basis.

5.13.5 Rodents

The City has declared the infestation of rodents a city-wide, severe problem. To control this infestation, the City enforces the requirements established under the Massachusetts State Sanitary Code, Chapter 211, 105 CMR 410.550 and the State Building Code, Section 108.6. Policy Number 87-4 (City of Boston). Under these codes, preparation of a program for the extermination of rodents shall be required in conjunction with the issuance of permits for demolition, excavation, foundation, and basement rehabilitation. The Proponent will prepare and adhere to a rodent control program prior to demolition, and on a regular basis throughout the duration of construction.

5.13.6 Construction Staging – Public Safety

During the construction period, pedestrian activity adjacent to the Project Site may be impacted by sidewalk closures. A variety of measures will be considered and implemented to protect the safety of pedestrians. Temporary walkways, appropriate lighting, and new directional and informational signage to direct pedestrians around the construction sites will be provided. After construction is complete, finished pedestrian sidewalks will be permanently reconstructed to meet ADA standards around the new facilities. Any damage as a result of construction vehicles or otherwise will be repaired, per City standards.

5.14 Historic Resources and Properties

A survey was undertaken to identify historic resources within proximity of the Project Site. Resources and properties located within a 0.25-mile radius of the Project Site, that are listed in the National and State Registers of Historic Places and / or are included in the Inventory of Historic and Archaeological Assets of the Commonwealth (the "Inventory"), are considered historic and have been identified in figure 5.6. Refer to Appendix G for a summary of these resources.

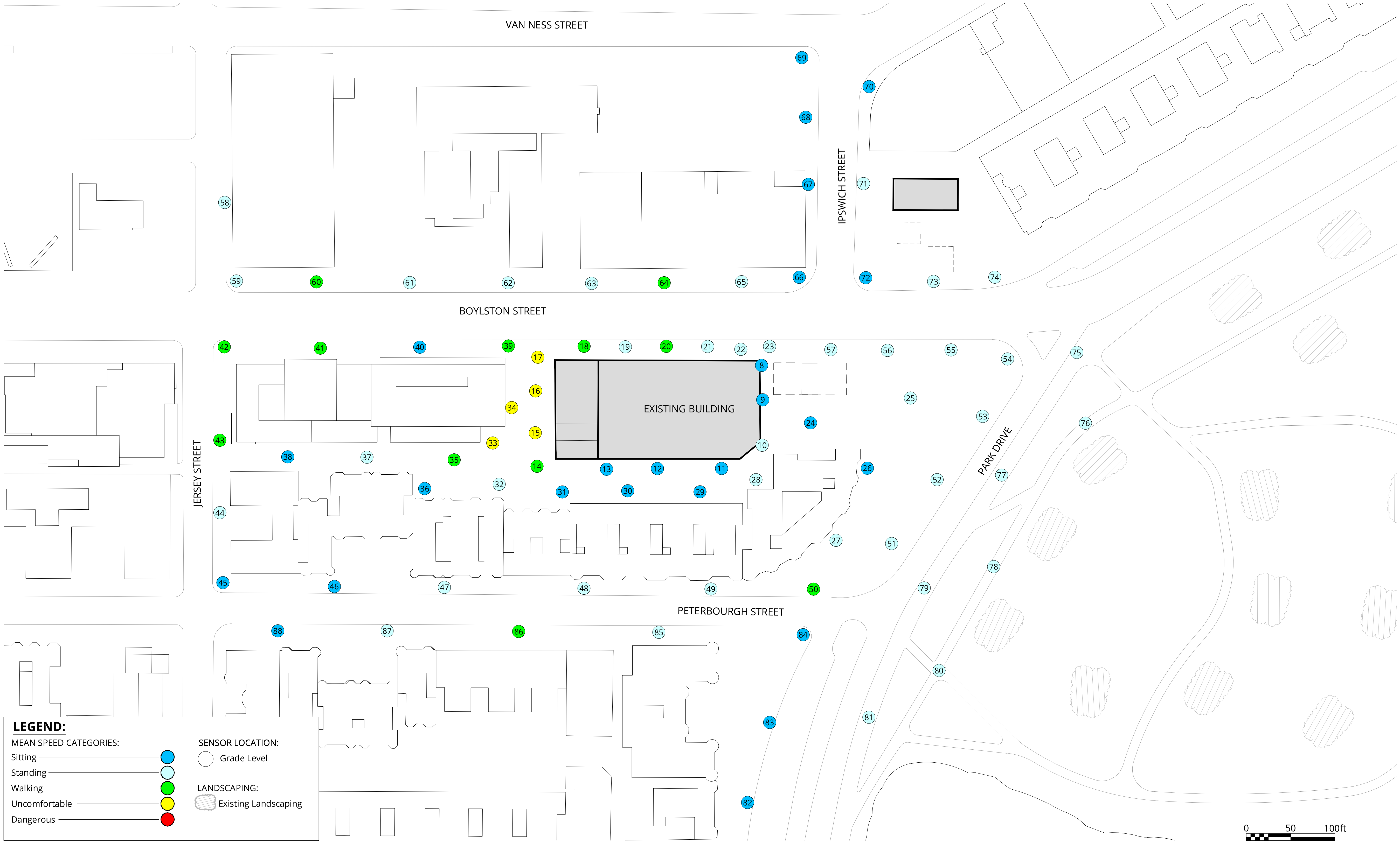
There are no historic resources or properties within the Project Site. Collectively, the Project Site contains two buildings, 1252-1268 Boylston Street and 1270 Boylston Street. Neither building is considered historically significant, nor listed in the State or National Registers of Historic Places, nor included in the Inventory.

No previously identified archaeological resources are located within the Project Site. Additionally, no impacts to significant archaeological resources are anticipated as a result of the Project.

The Project has been designed to be sensitive to the height, scale, massing, and materials of the surrounding residential neighborhood, including nearby historic resources. Consistent with the Fenway Urban Village Plan vision, the Project will improve the existing conditions of the Project Site and enhance connectivity along the Boylston Street corridor.

The Project is consistent with development along the Boylston Street corridor and, as discussed in Chapter 2, *Urban Design*, the design aligns with the surrounding urban fabric. The selected building materials embrace elements of the neighborhood's design heritage and express them in a contemporary fashion.

The Project will feature a contextual multi-dimensional stepped design, with the massing and the facade resembling three separate buildings, steadily decreasing in height towards the east and the south. An elevated, landscaped terrace, on the Project's south side, forms an open, vertical shaft, thereby reducing the central mass of the building.

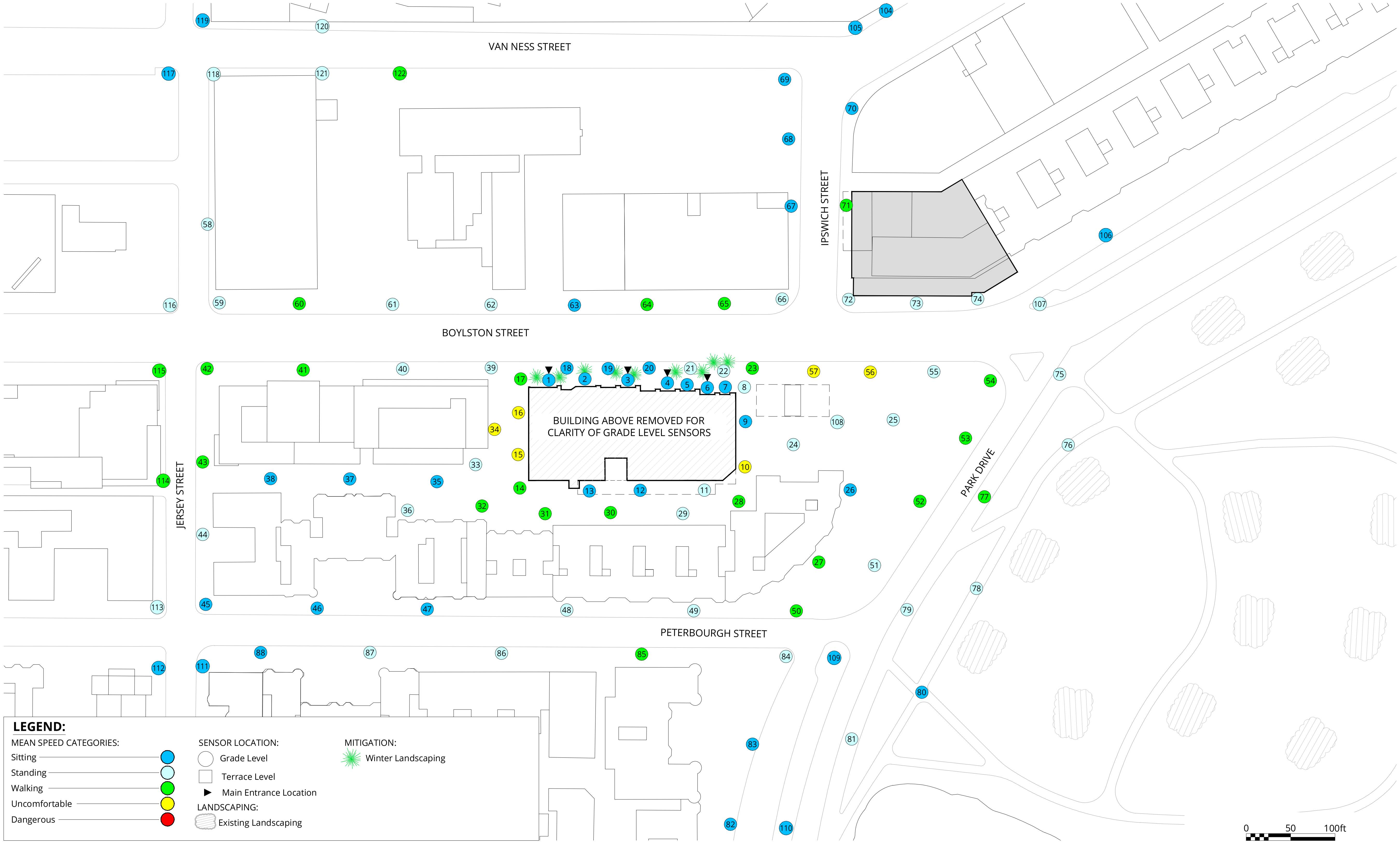


Source: RWDI

Figure 5.1a

No Build Wind Condition
Mean Speed

1252-1270 Boylston Street
Boston, Massachusetts

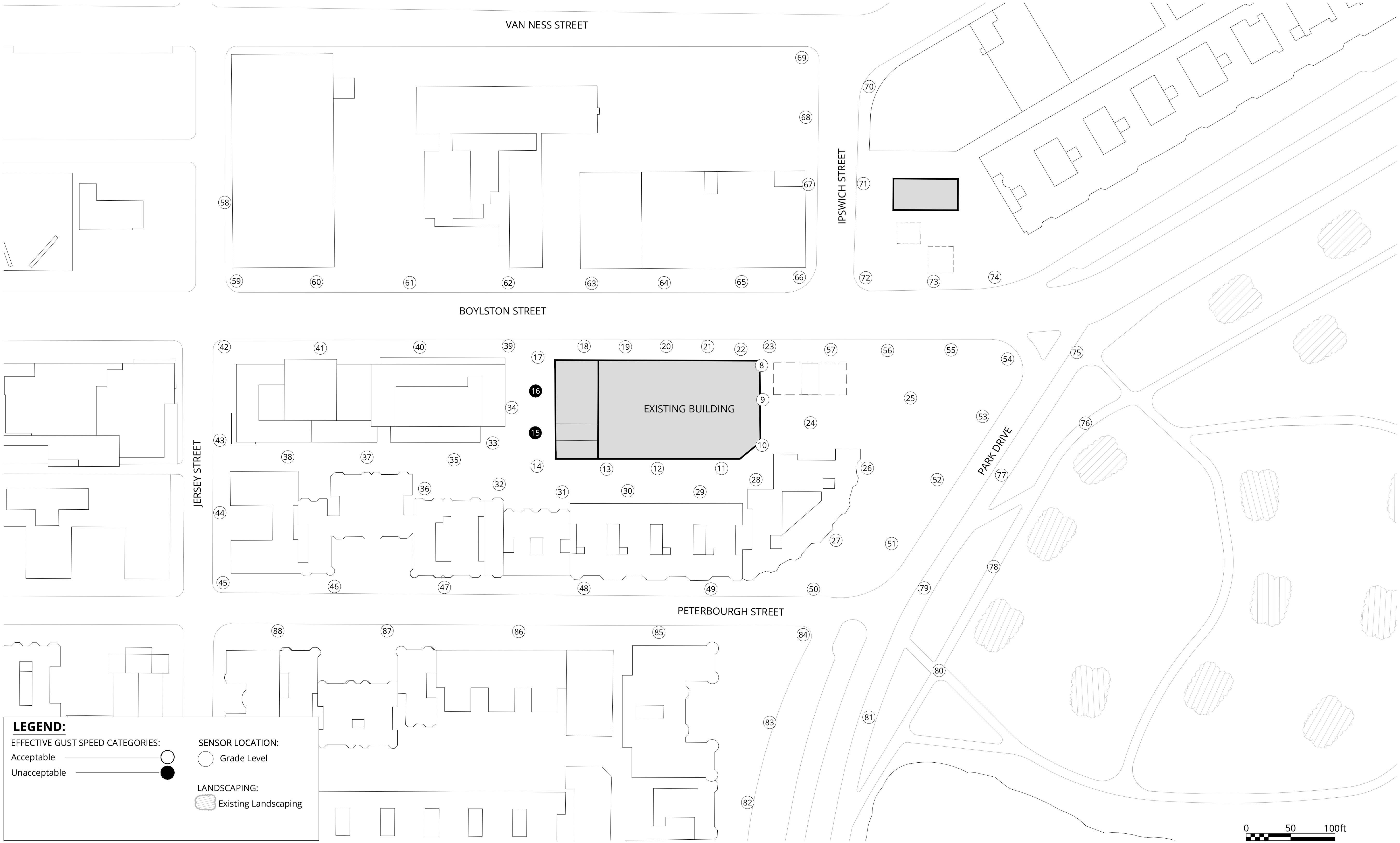


Source: RWDI

Figure 5.1b

Build Wind Condition
Mean Speed

1252-1270 Boylston Street
Boston, Massachusetts

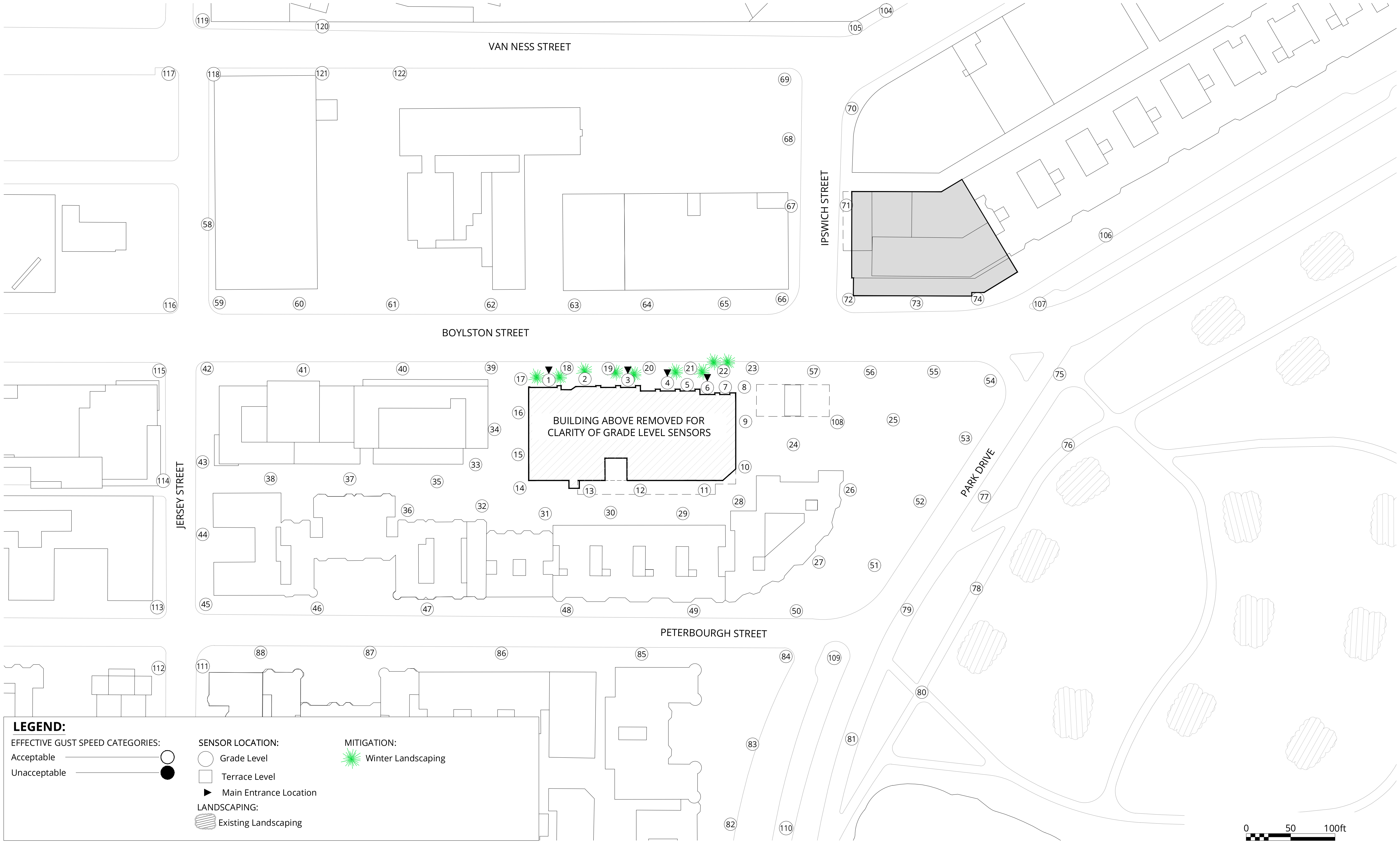


Source: RWDI

Figure 5.1c

No Build Wind Condition
Effective Gust Speed

1252-1270 Boylston Street
Boston, Massachusetts

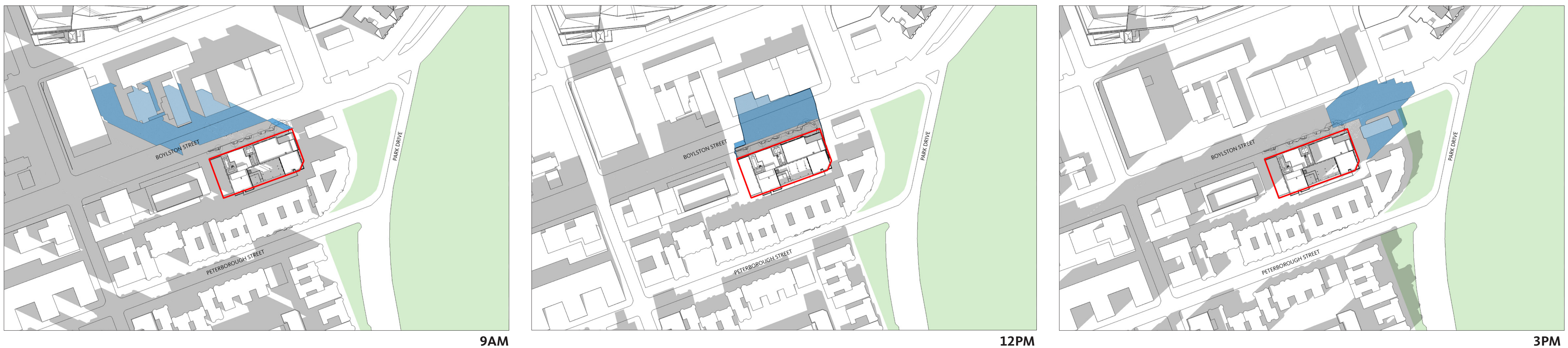


Source: RWDI

Figure 5.1d

Build Wind Condition
Effective Gust Speed

1252-1270 Boylston Street
Boston, Massachusetts



EXISTING SHADOW — EXISTING BUILDING NET NEW SHADOW - STREET LEVEL NET NEW SHADOW - ROOF LEVEL PUBLIC GREEN SPACE

10 20 60 100

Source: Gensler

Figure 5.2a
Shadow Studies
March 21

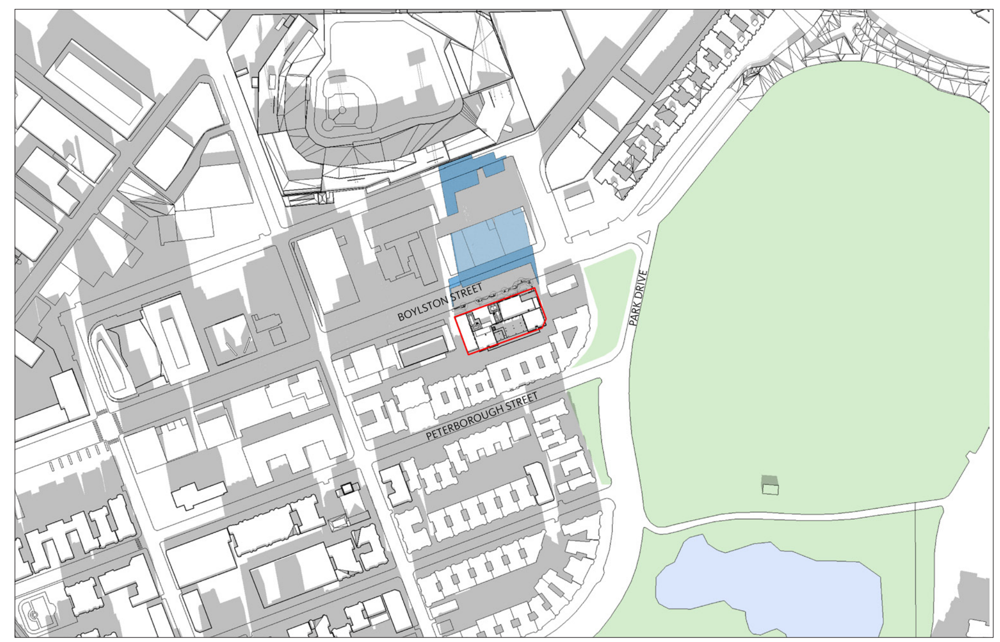
Source: Gensler

Figure 5.2b
Shadow Studies
June 21

Source: Gensler

Figure 5.2c
Shadow Studies
September 21

9AM



12PM

3PM

EXISTING SHADOW — EXISTING BUILDING NET NEW SHADOW - STREET LEVEL NET NEW SHADOW - ROOF LEVEL PUBLIC GREEN SPACE

N
20 40 120 200

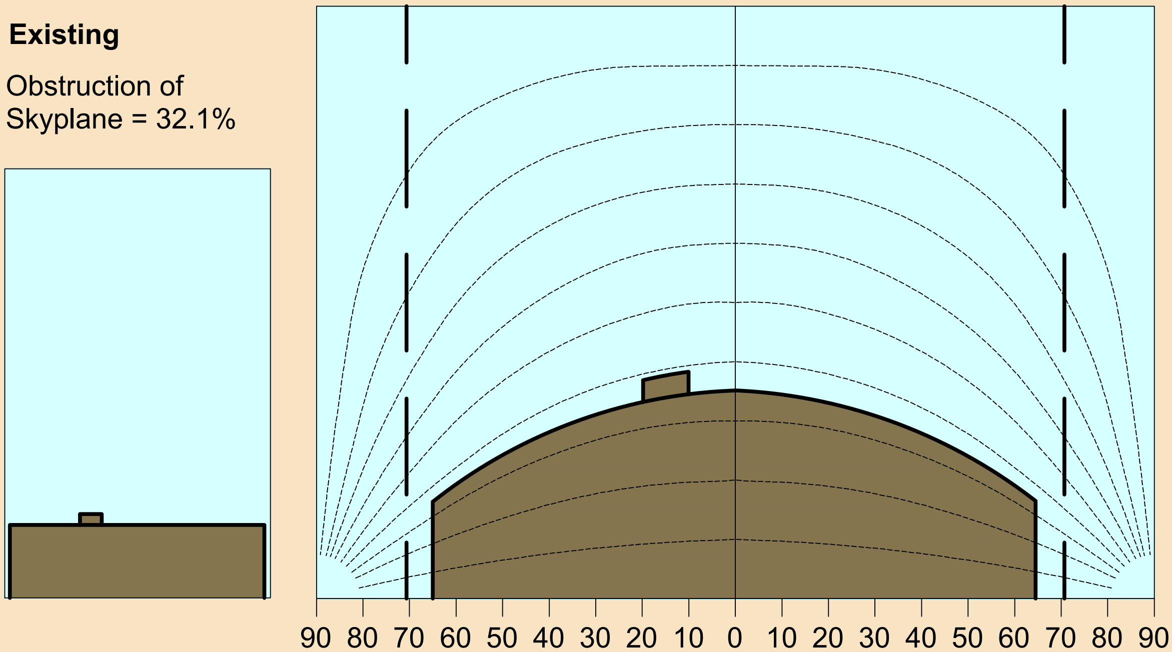
Source: Gensler

Figure 5.2d
Shadow Studies
December 21

1252-1270 Boylston
Boston, Massachusetts

Existing

Obstruction of Skyplane = 32.1%



Proposed

Obstruction of Skyplane = 63.1%

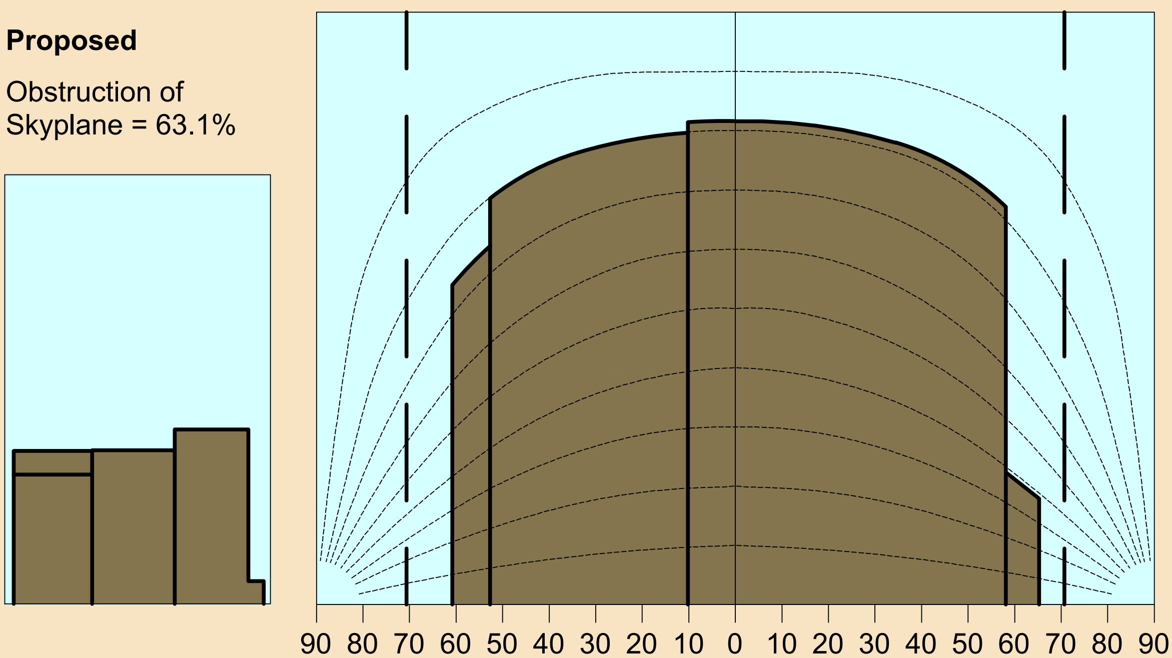
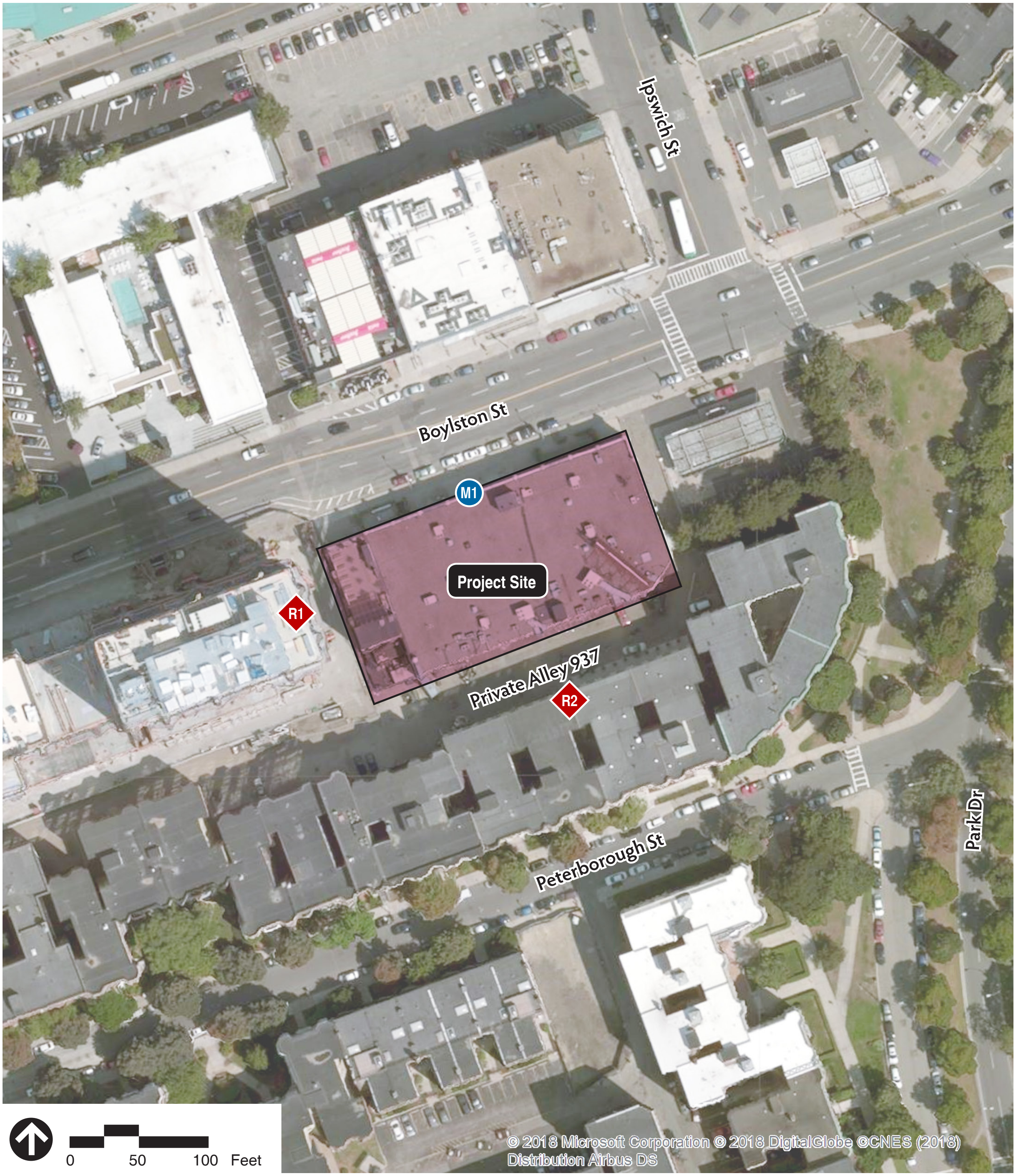


Figure 5.3

Daylighting Analysis
Center of Boylston Street

1252-1270 Boylston Street
Boston, Massachusetts



Source: SCAPE Site Environmental Noise Assessment, Acentech, October 25, 2018.

M# Monitoring Locations

R# Receptor Locations

vhb

Figure 5.4

Noise Receptor Locations

1252-1270 Boylston Street
Boston, Massachusetts

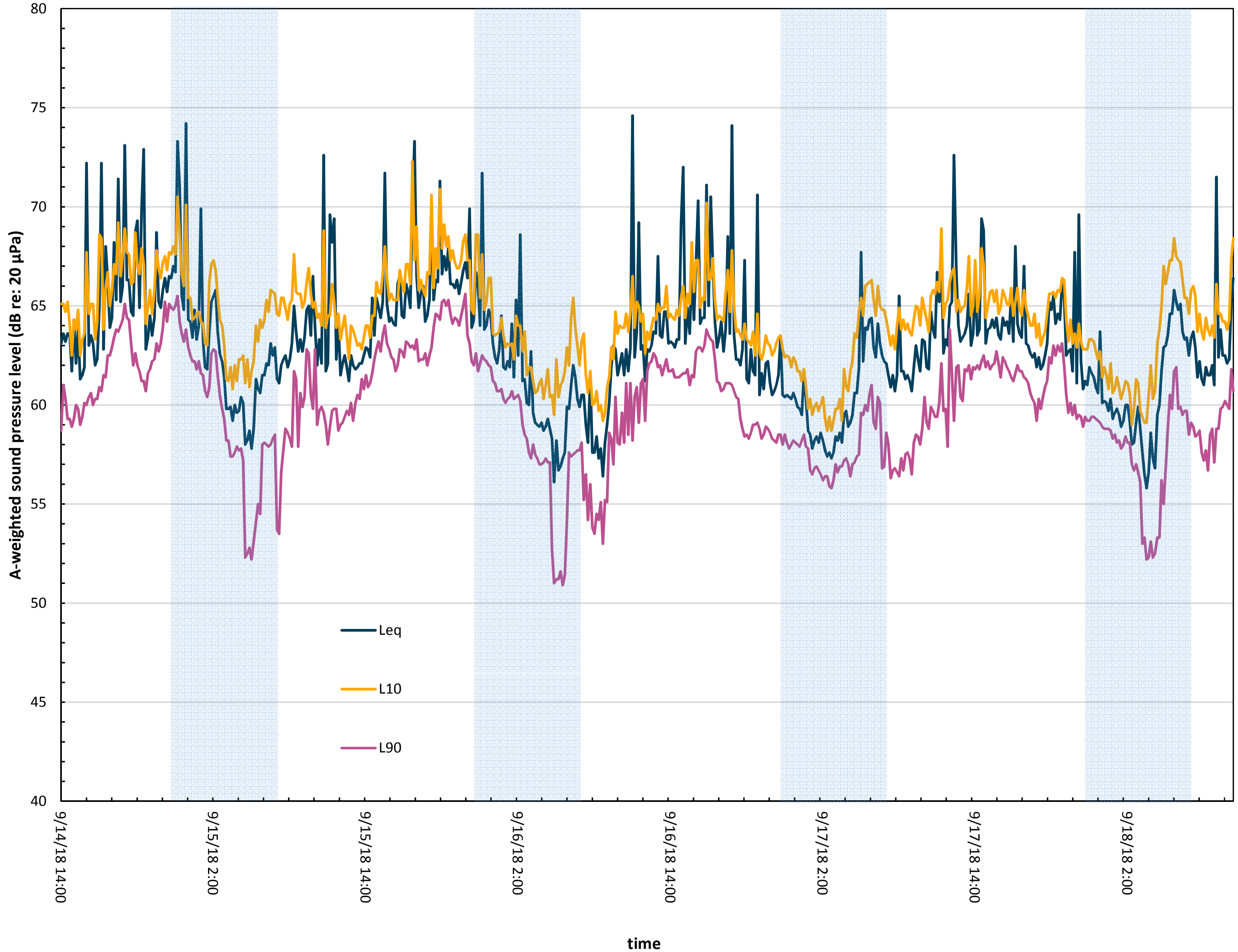
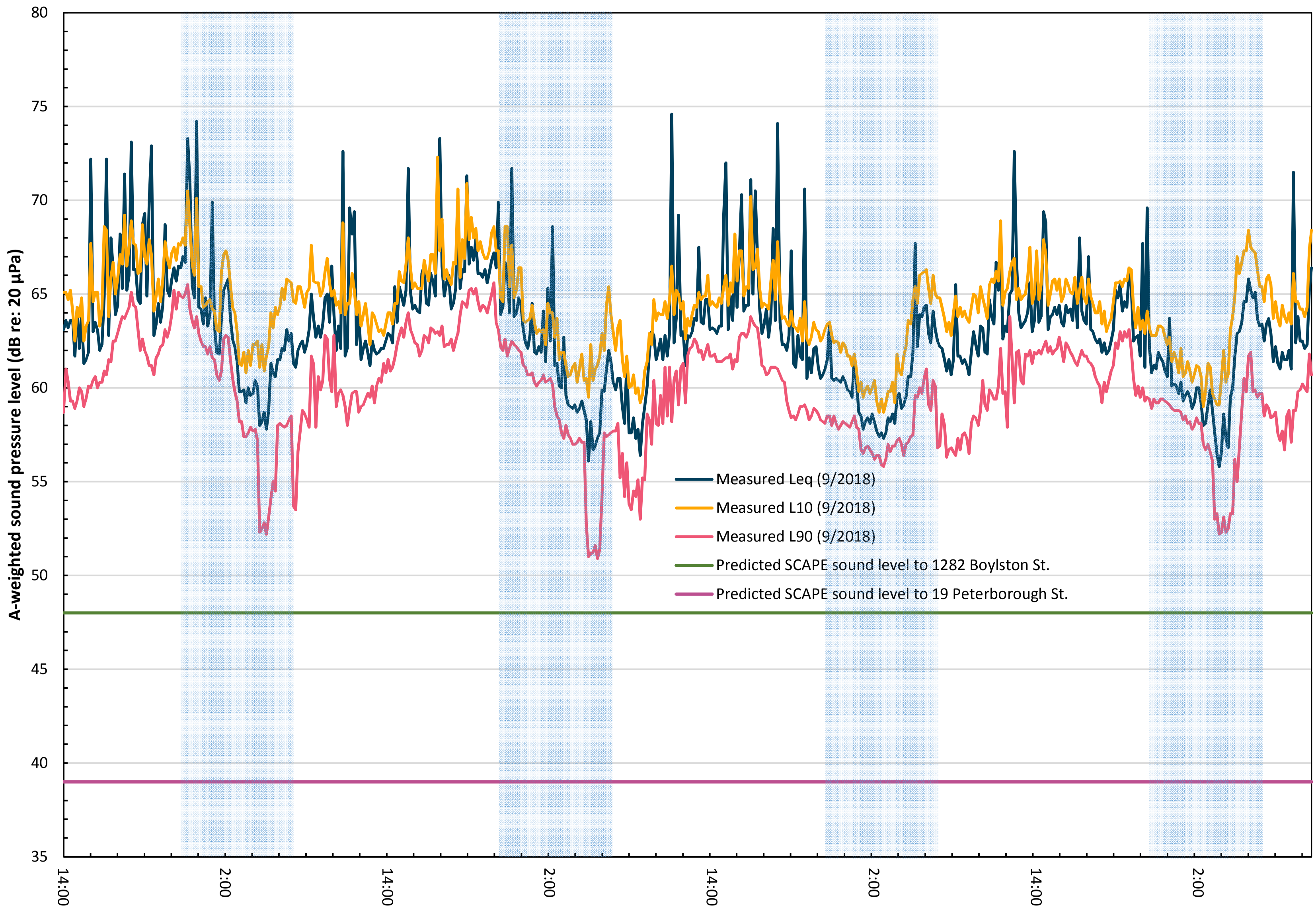


Figure 5.5a

Environmental Noise Levels - Existing

1252-1270 Boylston Street
Boston, Massachusetts

Source: Acentech

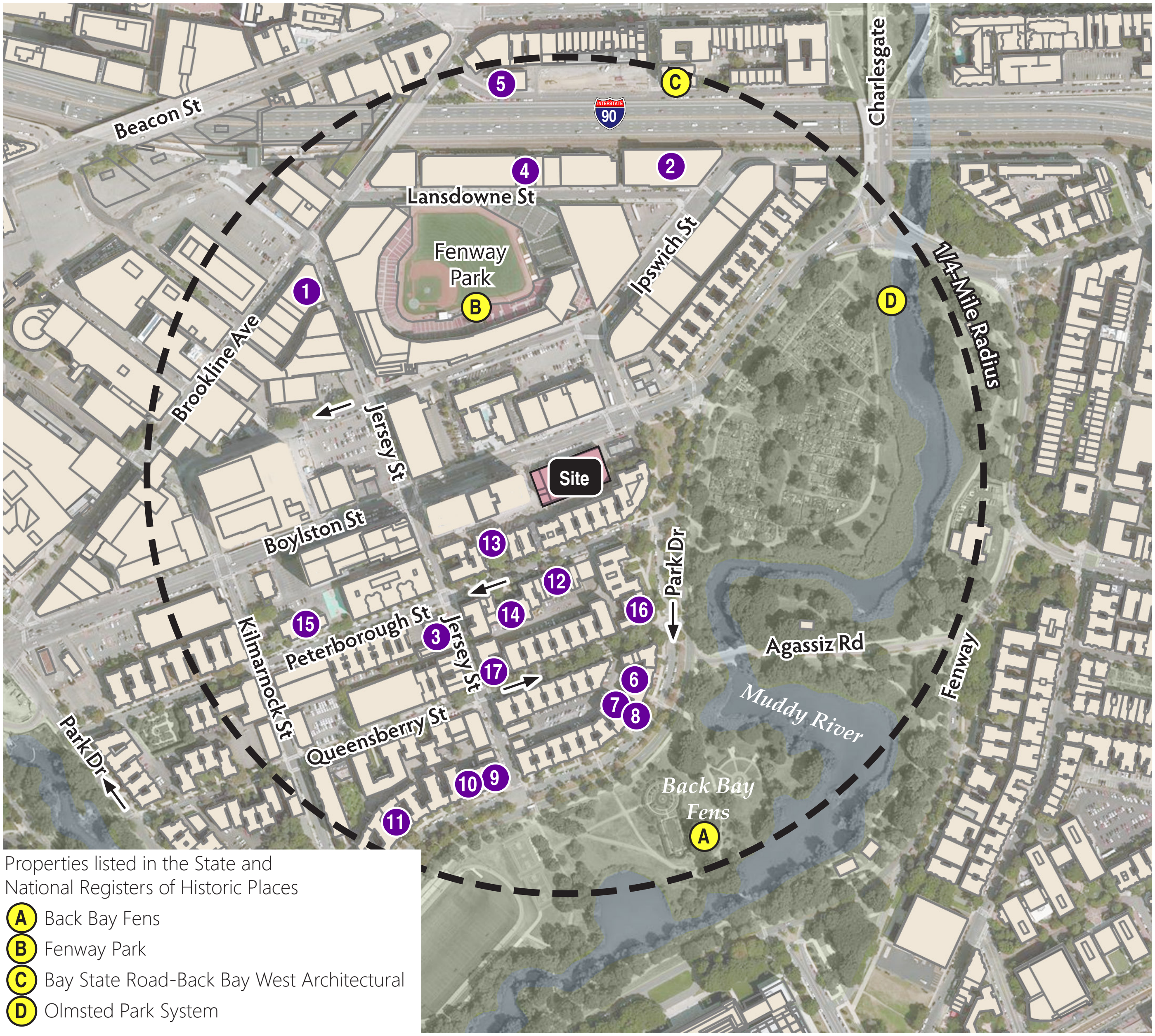


Source: Acentech

Figure 5.5b

Environmental Noise Levels - Existing and Predicted

1252-1270 Boylston Street
Boston, Massachusetts



Properties listed in the State and National Registers of Historic Places

- A Back Bay Fens
- B Fenway Park
- C Bay State Road-Back Bay West Architectural
- D Olmsted Park System

Properties included in the Inventory of Historic and Archaeological Assets of the Commonwealth

1. M.E. Wyzanski Building
2. Park Riding School
3. Church of the Disciples (Boston Temple Seventh-day Adventist Church)
4. R.H. Booth Sales Company/U.S. Post Office – Kenmore Station Branch
5. Standard Rim and Wheel Company Building (Boston University – Art Institute of Boston)
6. Fen Drive Apartment Building
7. Nashdome Apartment Building
8. Park Drive Apartment Building
9. Theodore M. Clark Town House
10. Apartment Building
11. Rotenberg and Rudnick
12. H.C. Birburie Town Houses
13. Sumner Apartment Building
14. Stuart Apartment Building
15. Martin Milmore Public School
16. Robert Treat Paine Jr. Town House
17. The Grocery Store Pantry

0 250 500 Feet

Source: ArcGIS Online Bing Aerial

Figure 5.6

Historic Resources

1252-1270 Boylston Street
Boston, Massachusetts

6

Infrastructure

This chapter identifies the existing infrastructure systems proximate to the Project Site and describes the utility components and the anticipated impacts of the Project. The following utilities are discussed: storm drainage, stormwater, sanitary sewage, wastewater, domestic water, fire protection, natural gas, electrical, and telecommunications.

The Project anticipates connecting to existing utility systems available in public streets adjacent to the Project Site. These utility systems include those both owned or managed by BWSC, as well as those owned by private utility providers.

The Proponent will coordinate the design of proposed utility connections with BWSC and applicable private utility providers. All utility connections will be designed to minimize impacts on the existing systems and surrounding areas. Figure 6.1 identifies the existing utility infrastructure proximate to the Project Site.

6.1 Summary of Key Findings and Benefits

The key impact assessment findings related to infrastructure systems include:

- The existing utility infrastructure systems are expected to be adequately sized to accept the demand associated with the development and operation of the Project.
- The Project will comply with the *2008 MassDEP Stormwater Management Policy and Standards;* accordingly, both the quality and the efficiency of stormwater runoff from the Project Site will be improved compared to the existing conditions.
- Groundwater will be recharged in accordance with GCOD and BWSC requirements to the maximum extent practicable.
- Based on current design and program, the Project is estimated to generate approx. 39,285 net new gallons per day of sanitary sewer discharge and will require 89,230 gallons of water demand per day.
- The Project anticipates incorporating onsite stormwater management and treatment systems to improve water quality, reduce runoff volumes, and control peak rates of runoff compared to the existing conditions.
- The Project is not expected to result in the introduction of any increased peak flows, pollutants, or sediments that would potentially impact the local storm drainage systems.

6.2 Regulatory Control

This section details the regulatory framework for utility connection reviews and standards for the Project (note, a list of the anticipated state and local permits associated with Project-related infrastructure is included in Table 1-2 of Chapter 1, *Project Description*):

- BWSC approval will be required for all storm drain, sanitary sewer, and water service connections to BWSC infrastructure.
- The Boston Fire Department (BFD) will review the Project with respect to fire protection measures, including fire department connections, hydrants, and standpipes.
- Design of access programming, hydrant locations, and energy systems (gas and electric) will be coordinated with the respective system owners.
- In locations where new utility connections are needed – and in locations where existing connections are to be capped – the excavation will be authorized, as required, by the Boston Public Works Department (BPWD) through the street opening permit process.
- The Project will conform with the Green Infrastructure requirements of the BPDA Smart Utilities Pilot Policy.

6.2.1 EPA National Pollutant Discharge Elimination System

The EPA requires that all projects that disturb greater than one acre of land obtain a Construction General Permit (CGP) for stormwater discharges - the National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Construction Activity. Compliance with the CGP is achieved by the following:

- Developing and implementing a Stormwater Pollution Prevention Plan (SWPPP);
- Completing, certifying, and submitting a Notice of Intent to the EPA; and
- Complying with the requirements contained in the CGP.

Compliance with the CGP and its Standard Permit Conditions is the responsibility of the construction site contractor and (or) site operator, who the Proponent will manage and oversee appropriately.

6.2.2 MassDEP Stormwater Standards

In March 1997, MassDEP adopted a new Stormwater Management Standards to address non-point source pollution. MassDEP published the Massachusetts Stormwater Handbook as guidance on the Stormwater Management Standards, which was revised in February 2008. The Stormwater Management Standards are regulated under the Wetlands Protection Act Regulations 310 CMR 10.05(6)(k) through (q). The Stormwater Management Standards prescribes specific stormwater management standards for redevelopment projects, including urban pollutant removal criteria for projects that may impact environmental resource areas.

6.2.3 Groundwater Conservation Overlay District (GCOD)

Under Article 32 of the Code, a conditional use permit is required for projects within the GCOD involving paving or other surfacing of lot area, erection or extension of any structure occupying more than 50 square feet of lot area, or construction of a structure involving excavation below-grade to a depth of seven or more feet below BCB. Accordingly, the Project will be expected to infiltrate not less than one inch of rainfall across the portion of the Project Site that will be occupied by the proposed improvements, to ensure that the Project does not cause a reduction in groundwater levels on the Project Site, or on adjacent lots.

6.2.4 BWSC Site Plan Review

All improvements and connections to BWSC infrastructure will be reviewed by BWSC as part of the Site Plan Review process. This process includes a comprehensive design review of the proposed service connections, assessment of system demands and capacity, and establishment of service accounts for water, sewer, and stormwater systems.

6.2.5 BPDA Smart Utilities Policy

Adopted in June of 2018, the BPDA's Smart Utilities Policy seeks to develop a more equitable, sustainable, affordable, resilient, and integrated planning approach around energy, transportation, water, and communication utilities in the City. Per the policy, Smart Utility Technologies (SUTs) required for Article 80 Large Project Review projects will depend on: (a) the floor area of the Project, and (or), (b) the Project's required mitigation of traffic, street lighting, and surface water runoff.

The Project proposes 235,095 square feet, which exceeds a development review threshold of 100,000 square feet. Therefore, the BPDA, in consultation with BWSC, shall recommend the use of Green Infrastructure to retain a volume of runoff onsite, prior to discharge. The volume of runoff shall be equal to 1.25 inches of rainfall multiplied by the total impervious area on the Project Site. Additionally, the Project proposes right-of-way improvements, including street light installation.

6.3 Stormwater Management

This section describes the existing storm drain infrastructure pertinent to the Project Site and describes how this infrastructure will service the Project in the future.

6.3.1 Existing Drainage Conditions

Presently, the Project Site is occupied by two buildings, which comprise a majority of the existing land area. The existing buildings are bordered by a concrete sidewalk to the north and privately owned bituminous concrete paved alleys to the east and to the south. Based on the existing conditions survey, and available record information, there is no evidence of stormwater quality treatment best management practices (BMPs) or infiltration / detention BMPs onsite.

Onsite surface runoff from the north side of the Project Site flows into Boylston Street, where it is collected by BWSC-owned catch basins. This will be confirmed with BWSC during the Site Plan Review process and repaired where possible.

Onsite surface runoff on the east side and on the south side of the Project Site is collected by a single inlet behind the existing buildings in Private Alley 937. A 6-inch storm drain conveys these flows to an existing 18-inch storm drain, located to the east of the existing buildings. These stormwater flows are then conveyed by the 18-inch storm drain northward to the existing 32-inch by 42-inch sanitary sewer main in Boylston Street, which appears to be an illicit connection. This will also be confirmed with BWSC during the Site Plan Review process.

No roof drain connections were located on the existing conditions survey or indicated on BWSC record information. Evaluations of the existing conditions indicate that currently in-place roof drain connections are conveyed illicitly to the sanitary sewer main in Boylston Street. These existing drains will be located and discontinued as part of the Project.

According to BWSC system maps and record information, the BWSC owns and maintains the catch basins and additional drainage infrastructure in the public way which serves the Project Site. An 18-inch storm drain main runs along the southern curbline of Boylston Street, directly in front of the Project Site. This storm drain appears to be conveyed to a 116-inch by 120-inch storm drain main within Brookline Avenue that ultimately discharges into the Charles River Basin at Storm Drain Outfall (SDO) #042. Refer to Figure 6.1 for the existing drainage facilities serving the Project.

The 18-inch storm drain line on the east side of Private Alley 937 also appears to be owned by BWSC. This storm drain line is illicitly connected to the 32-inch by 42-inch sanitary sewer main in Boylston Street.

6.3.2 Proposed Drainage Conditions

Pursuant to the City's stormwater management requirements and Smart Utilities Policy, as well as MassDEP's Stormwater Management Policy, the Project will incorporate onsite stormwater management and treatment systems to the maximum extent practicable. These systems collectively are expected to improve water quality, reduce runoff volume, and control peak rates of runoff in comparison to existing conditions. Additionally, the Project anticipates reducing peak discharge rates and volumes during various storm events, including the 2-, 10-, and 25-year design storms. Stormwater runoff from proposed and modified impervious surface areas is expected to be treated using new infrastructure, including but not limited to deep sump hooded catch basins, subsurface infiltration basins, and (or) proprietary treatment devices to reduce the Total Suspended Solids (TSS) concentrations by at least 80%.

Pursuant to the requirements of Article 32 of the Code – and as applicable for sites located within the GCOD – the Project will infiltrate more than 1.00 inch of rainfall across the portion of the Project Site occupied by the proposed improvements. In addition, the Project will comply with the standards of the Smart Utilities Pilot Policy, which increases the infiltration requirement from 1.00 inch of rainfall to 1.25 inches.

Additionally, consistent with the recommendation of the BPDA's Smart Utilities Policy, the Proponent will coordinate with BWSC to evaluate the potential integration of Green Infrastructure elements to retain a greater volume of stormwater runoff and to increase infiltration capacity for the Project.

6.3.3 Compliance with EPA NPDES

While the Project Site is approx. 0.77 acres, when considering the proposed work within the right-of-way and adjacent private alleys, the Project will potentially affect over an acre of land. Therefore, the Project may be required to obtain coverage under the EPA NPDES CGP. Accordingly, the Proponent may:

› Develop and implement a SWPPP;

› Certify and submit a Notice of Intent to the EPA; and

› Comply with the requirements contained in the CGP.

The Proponent will ensure that the site contractor and (or) site operator perform the NPDES requirements during construction.

6.3.4 Compliance with MassDEP Stormwater Standards

The Project will comply with the Stormwater Management Standards as established in the Massachusetts Stormwater Handbook issued by MassDEP in 1997 and revised in 2008. A brief summary of each standard – and the Project's respective compliance – is provided below:

Standard 1: *No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

› Compliance: The Project will comply with Standard 1. All proposed stormwater conveyances for the Project will not discharge untreated stormwater directly to or cause erosion to wetlands or waters.

Standard 2: *Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*

› Compliance: The Project will comply with Standard 2. As a result of the improvements associated with the Project, the post-development peak discharge rates will not exceed the pre-development peak discharge rates.

Standard 3: *Loss of annual recharge to groundwater should be minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type.*

- Compliance: The Project will comply with Standard 3. The Project anticipates incorporating subsurface infiltration systems to provide the required groundwater recharge. Further geotechnical explorations are planned to establish recharge rates and the seasonal high groundwater elevation.

Standard 4: *Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when: a) Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained; b) Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

- Compliance: The Project will comply with Standard 4. Stormwater runoff will be captured in a series of deep sump hooded catch basins and (or) directed to proprietary particle separators to provide 80% TSS removal prior to discharging to the existing drainage systems. Infiltration systems also provide highly effective pollutant removal during low intensity storms.

Standard 5: *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If, through source control and (or) pollution prevention, all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated there under at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

- Compliance: The Project will comply with Standard 5. The Project Site is not anticipated to be a land use with higher potential pollutant loads. However, the Project will implement preventative measures to reduce the discharge of stormwater runoff to the maximum extent practicable.

Standard 6: *Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge"* *as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

› Compliance: The Project will comply with Standard 6. The Project is not located within a critical area, nor will it discharge untreated stormwater to a critical area.

Standard 7: *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

› Compliance: The Project will comply with Standard 7. The Project is considered a redevelopment and will be designed to comply with applicable Stormwater Management Standards.

Standard 8: *Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.*

› Compliance: The Project will comply with Standard 8. Sedimentation and erosion controls will be incorporated as part of the design of the Project and be employed during construction. Erosion and sedimentation control plans will be submitted to the BWSC on a component-by-component basis, and the contractor will be required to implement the measures as part of the BWSC general service application process.

Standard 9: *A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

› Compliance: The Project will comply with Standard 9. An operations and maintenance plan ("O&M Plan"), including long-term BMP operation requirements, will be prepared for the Project to ensure proper maintenance and functioning of the proposed stormwater management system.

Standard 10: *All illicit discharges to the stormwater management system are prohibited.*

› Compliance: The Project will comply with Standard 10. There will be no new illicit connections associated with the proposed Project. Additionally, the Project team will work with BWSC to repair existing illicit connections to the maximum extent practicable.

6.3.5 Compliance with GCOD

The Project Site is located within the GCOD, as established by Article 32 of the Code. Accordingly, the Project will include facilities to capture stormwater runoff and direct it to infiltration systems consistent with the requirements of Article 32 to the maximum extent practicable, with the objective of replenishing the groundwater table.

To provide groundwater recharge to the maximum extent practicable, the proposed stormwater management system will include recharge chambers or wells designed to infiltrate runoff over a 72-hour period.

Prior to the issuance of a building permit, the Proponent will provide the BPDA, BWSC, and the Boston Groundwater Trust with a letter detailing the elements of the Project which successfully achieve the critical GCOD requirement of no reduction in groundwater levels onsite or on adjoining lots. The letter will be stamped by a professional engineer, who is registered in Massachusetts.

6.3.6 BWSC Site Plan Review

The Project will require BWSC Site Plan Review and approval. The Proponent will coordinate with BWSC on the design of any proposed connections and to ensure there is adequate capacity in the existing storm drain systems. Mitigation measures provided by the Proponent will also be agreed upon with BWSC, once the proposed design for the Project reaches an appropriate level of detail. The Project will also evaluate the use of BMPs during the BWSC Site Plan Review process.

6.3.7 BPDA Smart Utilities Policy

The Project will be subject to the Green Infrastructure requirements of the Smart Utilities Policy, as it exceeds 100,000 square feet. To meet these requirements, the site design will aim to retain onsite stormwater runoff prior to discharge, as discussed previously in Section 6.3.2.

In collaboration with BWSC, the BPDA will review the Project utility connections and recommend improvements in compliance with the Smart Utility Standards, set forth by the BPDA and the City.

6.4 Sanitary Sewer

The following section identifies the existing sanitary sewer infrastructure proximate to the Project Site and describes anticipated sanitary sewer servicing for the Project.

6.4.1 Existing Sewer System

The BWSC owns and maintains sanitary sewer lines near the Project Site. As demonstrated in Figure 6.1, the infrastructure includes:

- An existing 32-inch by 42-inch sanitary sewer line within Boylston Street. This sanitary sewer line flows in a westerly direction in Boylston Street and discharges to Massachusetts Water Resources Authority (MWRA) mains in the Fenway area. Sanitary flows from the MWRA mains are then conveyed to the Deer Island Wastewater Treatment Plant. The system is shown on BWSC mapping as separated sanitary sewer, although there appears to be illicit drain connections onsite and in the vicinity of the Project Site.

› An existing 12-inch sanitary sewer line on the east side of the existing building within Private Alley 937. This sanitary sewer line discharges to the sanitary sewer main within Boylston Street, as described herein above.

6.4.2 Proposed Sewage Flow and Connections

Based on the anticipated development program, the Project is estimated to generate approx. 39,285 net new gallons per day of sanitary sewage. Table 6-1 demonstrates the proposed estimated sewer generation based on Massachusetts State Environmental Code (Title 5) generation rates.

Modifications to the development program may adjust sanitary flow.

Table 6-1 Estimated Sewer Generation

Program Type	Units	Generation Rate	Sewage Generation
Existing Mixed-Use			
Office w/ Second Floor	*24,023 SF*	*75 GPD/1,000 SF*	*1,801 GPD*
Retail	*5,679 SF*	*50 GPD/1,000 SF*	*284 GPD*
Restaurant, Fast Food	*100 Seats*	*20 GPD/Seat*	*2,000 GPD*
Restaurant	*650 Seats*	*35 GPD/Seat*	*22,750 GPD*
Lounge/Tavern	*750 Seats*	*20 GPD/Seat*	*15,000 GPD*
		Total Existing	**41,835 GPD**
Proposed Mixed-Use *Restaurant/Retail* [1]	*375 Seats*	*35 GPD/Seat*	*13,125 GPD*
Proposed Residential *Residential*	*618 Beds*	*110 GPD/Bed*	*67,980 GPD*
Proposed Parking *Structured Parking*	*15 Spaces*	*1 GPD/Space*	*15 GPD*
		Total Proposed	**81,120 GPD**
		NET NEW TOTAL	**39,285 GPD**

Note: Generation rates based on Title 5, 310 CMR 15.203 guidelines
GPD = gallons per day
1 To establish a worst-case scenario, this analysis assumes a restaurant program use which is typically a higher wastewater generator than dry retail uses.

6.4.3 Inflow and Infiltration (I/I) Mitigation

Since the Project is expected to generate an increase of net new sanitary sewer flows of approx. 39,285 gallons per day, certain regulatory thresholds are triggered. BWSC requires that new developments generating greater than 15,000 gallons per day of net new wastewater flows mitigate the impacts of the development by removing inflow and infiltration ("I/I") present in the existing sanitary sewer system. I/I is the component of flows in sanitary sewer systems that does not come from wastewater generated by building uses. I/I includes groundwater infiltration from leaking/broken sewer infrastructure, as well as illicit stormwater connections from roof leaders and drainage infrastructure. Following MassDEP and BWSC policy, projects that generate flows greater than the 15,000-gallon threshold are responsible for mitigating I/I at a ratio of 4:1 relative to the net-new wastewater generated. The Proponent is committed to working with BWSC to define the appropriate I/I mitigation.

6.5 Domestic Water and Fire Protection

This section identifies the existing water infrastructure proximate to the Project Site and describes anticipated water servicing for the Project.

6.5.1 Existing Water Supply System

BWSC owns and maintains the water mains near the Project Site. BWSC record drawings show that the Project Site is serviced by southern low-service pipes. A 16-inch main is located on the north side of Boylston Street. The main is pit cast iron and was originally constructed in 1896. BWSC cleaned and lined the main in 1990. Additionally, a fire hydrant is located on the north side of Boylston Street, across from the Project Site.

6.5.2 Proposed Water Demand and Connection

Domestic water demand is based on estimated sewage generation with an added factor of 10% for consumption, system losses, and other use. Based upon standard sewage generation rates outlined in the MassDEP System Sewage Flow Design Criteria, 310 CMR 15.203, the Project will require approx. 89,230 gallons of water per day. The building is designed to incorporate low-flow and low-consumption plumbing fixtures to reduce indoor water consumption by approx. 30 to 35% over the baseline, which is consistent with Article 37. Also, advanced water meters will be installed to track water usage data for the building with the goal of achieving additional efficiencies.

New water connections to BWSC infrastructure will be designed in accordance with BWSC design standards and requirements. Water services to the new buildings will be metered in accordance with BWSC's Site Plan Requirements and Site Review Process. The review includes, but is not limited to, sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and fire department connections to ensure conformity with BWSC and BFD requirements. The Proponent will provide the connection of the meter to BWSC's automatic meter reading system. Fire protection connections on the Project Site will also need approval of the BFD.

6.6 Other Utilities

This section identifies the other utility infrastructure (including natural gas, electrical, and telecommunications) proximate to the Project Site and describes anticipated associated servicing for the Project.

6.6.1 Natural Gas Service

Natural gas service is provided by National Grid near the Project Site. The existing natural gas service includes 6-inch mains on the north and south sides of Boylston Street. There is an existing service connection from the existing building to the 6-inch gas main on the south side of Boylston Street.

The total estimated natural gas demand for the Project is 3,987 MMBtu annually. As the energy system designs for the Project are developed, the Proponent will coordinate service connection locations and system requirements with National Grid to ensure adequate capacity for natural gas service is available for the Project. Final design and installation of natural gas services will similarly be coordinated with National Grid.

6.6.2 Electrical Service

Electrical service is provided by Eversource Energy in the vicinity of the Project Site and is available on Boylston Street. A ductbank originating from an electrical manhole, on the north side of Boylston Street, feeds a transformer located in the front of the existing building.

The estimated electricity demand for the Project is approx. 2,169,059 kWh annually.

The Proponent has met with Eversource Energy and service connection design is ongoing. It is anticipated that a new ductbank will connect to the existing electrical manhole in Boylston Street. The ductbank will connect to an Eversource vault located at the rear of the building, consistent with similar conditions along the south side of Boylston Street.

Onsite transformer facilities are required and will be subject to design and construction approval from Eversource. Final design and installation of electric services and components will similarly be coordinated with Eversource.

As the electric system design for the Project is further developed, the Proponent will coordinate service connection locations and system requirements with Eversource. Onsite transformer facilities are required and will be subject to design and construction approval from Eversource. Final design and installation of electric services and components will similarly be coordinated with Eversource.

6.6.3 Telecommunications

Record survey information indicates that telecommunication service is available in Boylston Street. An existing telecommunications manhole is located on the north side of Boylston Street, on the western limit of the Project.

The Proponent will select private telecommunications companies to provide telephone, cable TV, and data services. Upon selection of a provider or providers, the Proponent will coordinate service connection locations and system requirements, as well as obtain appropriate approvals.

6.6.4 Protection of Utilities During Construction

Existing public and private infrastructure located within the public way in the vicinity of the Project Site will be protected during construction of the Project. The installation of proposed utilities within the public way will be approved by and constructed in accordance with BWSC, BPWD, the Dig-Safe Program, and applicable private utility company requirements.

The Proponent will continue to coordinate with BWSC and applicable private utility companies to ensure safe and coordinated utility operations in connection with the Project. All necessary permits will be obtained prior to the commencement of any work in the field.

6.7 BPDA Smart Utilities Policy

The following section summarizes the components of the Project which address the City's Smart Utilities Policy for the Project.

6.7.1 Green Infrastructure

The Project will incorporate Green Infrastructure where feasible, to assist in absorbing, delaying, detaining, and treating stormwater at the Project Site. As recommended by the BPDA, the Proponent will work with BWSC to evaluate Green Infrastructure elements capable of retaining the required 1.25 inches over the impervious area of the Project Site.

6.7.2 Streetlight Installation

Technology-enabled (i.e. 'smart') street lighting is expected to be incorporated into the Project's design in order to reduce energy usage while maximizing safety for pedestrians, bicycle riders, and drivers.

It is anticipated that all proposed street lights will be designed with electrical and fiber-optic connections to facilitate the potential installation and programming of technology-enabled features (e.g. 'smart' sensors, Wi-Fi, cameras). As the design progresses, the Proponent will evaluate the feasibility of incorporating these features into the proposed street light design.

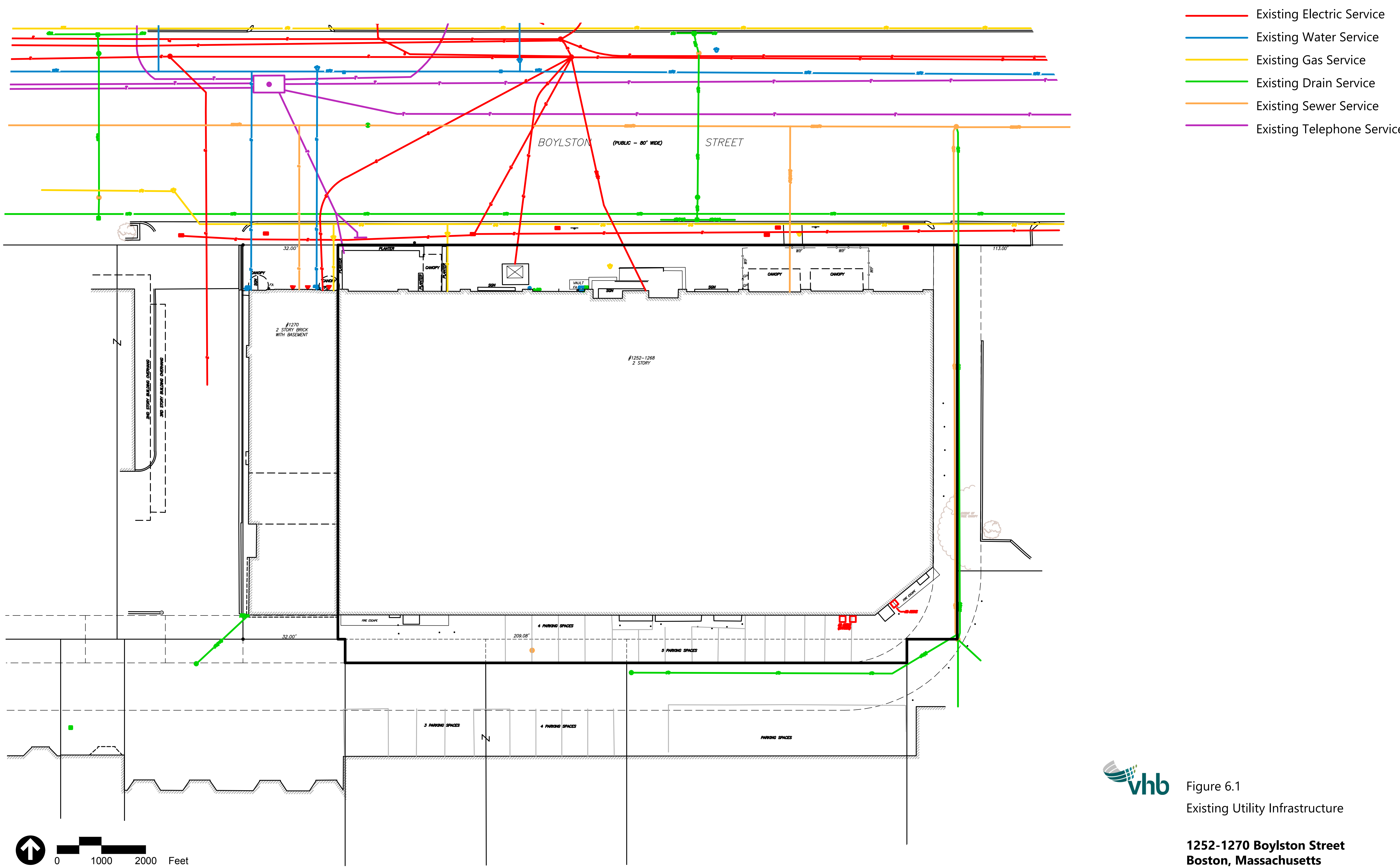


Figure 6.1
Existing Utility Infrastructure

1252-1270 Boylston Street
Boston, Massachusetts

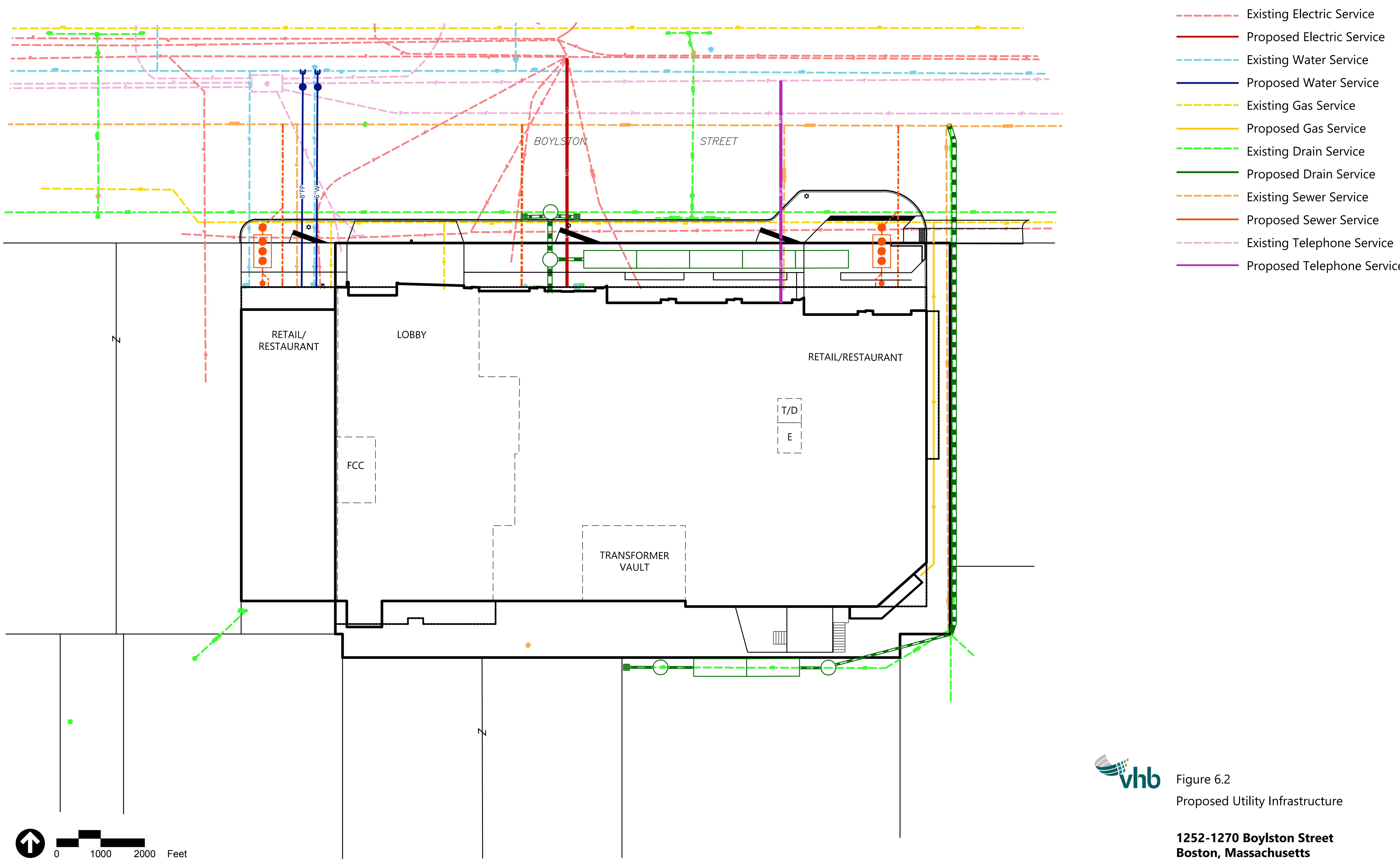


Figure 6.2
Proposed Utility Infrastructure

1252-1270 Boylston Street
Boston, Massachusetts

Appendix A: Boylston Black Box

Appendix A:

Boylston Black Box

As a stakeholder dedicated to the long-term vibrancy and character of the Fenway neighborhood, Scape Boylston, LLC (the “Proponent”) will be delivering the **Boylston Black Box** as part of the redevelopment of 1252-1268 Boylston Street and 1270 Boylston Street (the “Project”).

The Boylston Black Box will be an LGBTQ-centric venue for the performing arts – anchored by a 120-seat theater – which will be delivered and operated on a not-for-profit basis.

Commitment to an LGBTQ Identity

The Boylston Black Box will embrace the long-standing LGBTQ heritage of 1252-1268 Boylston Street and 1270 Boylston Street (the “Project Site”). Since the 1970s, the Project Site has served as the location of various LGBTQ entertainment venues, including ‘The 1270’, ‘Quest’, ‘RamRod’, and ‘Machine’. These entertainment venues have been emblematic LGBTQ spaces and have often served – directly and indirectly – as a base for the LGBTQ community in the Fenway neighborhood.

The Boylston Black Box will seek to honor the history of the LGBTQ community’s important relationship with the Project Site and with The Fens and will serve as an iconic location for the LGBTQ community going forward.

Alignment with Arts and Cultural Priorities

In conjunction with its commitment to an LGBTQ identity, the Boylston Black Box will also align with the arts and cultural priorities of the City of Boston (the “City”) and the ‘*Fenway Urban Village Plan (2015)*’.

While the approx. 6,000-square-foot Boylston Black Box will be newly-constructed, purpose-built and technology-enabled, it will also be versatile, flexible, accessible and affordable. The confluence of these critical traits will establish the Boylston Black Box as a premier arts and cultural destination and a hub for innovation and exploration.

The Boylston Black Box will accommodate programming across the spectrum of the performing arts and will address key objectives and challenges identified by the ‘*Boston Creates (2016)*’ report and the ‘*Boston Performing Arts Facilities Assessment (2018)*’, including:

Alignment with Arts and Cultural Priorities *(continued)*

'*Boston Creates* (2016)**':**

"A Plan for Action | Five Goals, Ten Years": ☑

1. "Create fertile ground for a vibrant and sustainable arts and culture ecosystem."
2. "Keep artists in Boston and attract new ones here, recognizing and supporting artists' essential contribution to creating and maintaining a thriving, healthy, and innovative city."
3. "Cultivate a city where all cultural traditions and expressions are respected, promoted, and equitably resourced, and where opportunities to engage with arts and culture are accessible to all."
4. "Integrate arts and culture into all aspects of civic life, inspiring all Bostonians to value, practice, and reap the benefits of creativity in their individual lives and in their communities."
5. "Mobilize likely and unlikely partners, collaborating across institutions and sectors, to generate excitement about, and demand and resources for, Boston's arts and culture sector."

'*Boston Performing Arts Facilities Assessment* (2018)**':**

Key findings include: ☑

- Over half of the arts groups surveyed have annual budgets less than $100,000.
- The two capacities most in demand by space-users were in the 100 to 150 seats and 400 to 600 seats ranges.
- With regards to existing spaces of under 150 seats, over half are fully booked or nearly fully booked.
- Rehearsal space is needed for small to mid-sized organizations – must be located near public transportation, must be extremely low cost and must include adequate technical amenities.
- Performance space is needed for small to mid-sized organizations – must be flexible, must be low cost and must include sophisticated technical amenities.
- Need to develop new tools for enhancing partnerships among developers, the City and the local arts community.

Design and Programming

With regards to designing and programming the Boylston Black Box, the Proponent has proactively engaged stakeholders through a series of focus groups, working sessions and performance attendances. This research and development pertaining to the Boylston Black Box has been guided by the following key principles:

- ***Listen*** to Fenway-based arts and cultural organizations in order to develop a venue that addresses and supports the needs of limited-budget, small to mid-sized performance groups.
- ***Celebrate*** the legacy of – and the preservation of – the Project Site's long-standing affiliation with the LGBTQ community by delivering a dedicated, permanent beacon for LGBTQ-centric arts and culture.
- ***Curate*** a comprehensive team of designers, artists and engineers to deliver a purpose-built, versatile space well-suited for a broad range of performing arts disciplines to maximize utilization.
- ***Partner*** with an operational team that is aligned with the interests of the Fenway neighborhood – and objectives of the City – to position the venue for long-term success.

This collaborative process – which remains ongoing – has consistently sought to balance creativity and practicality. While the design incorporates bespoke creative elements (for example, the feature staircase), the layout bears the hallmarks of thoughtful space-planning (for example, the storage areas and dressing rooms).

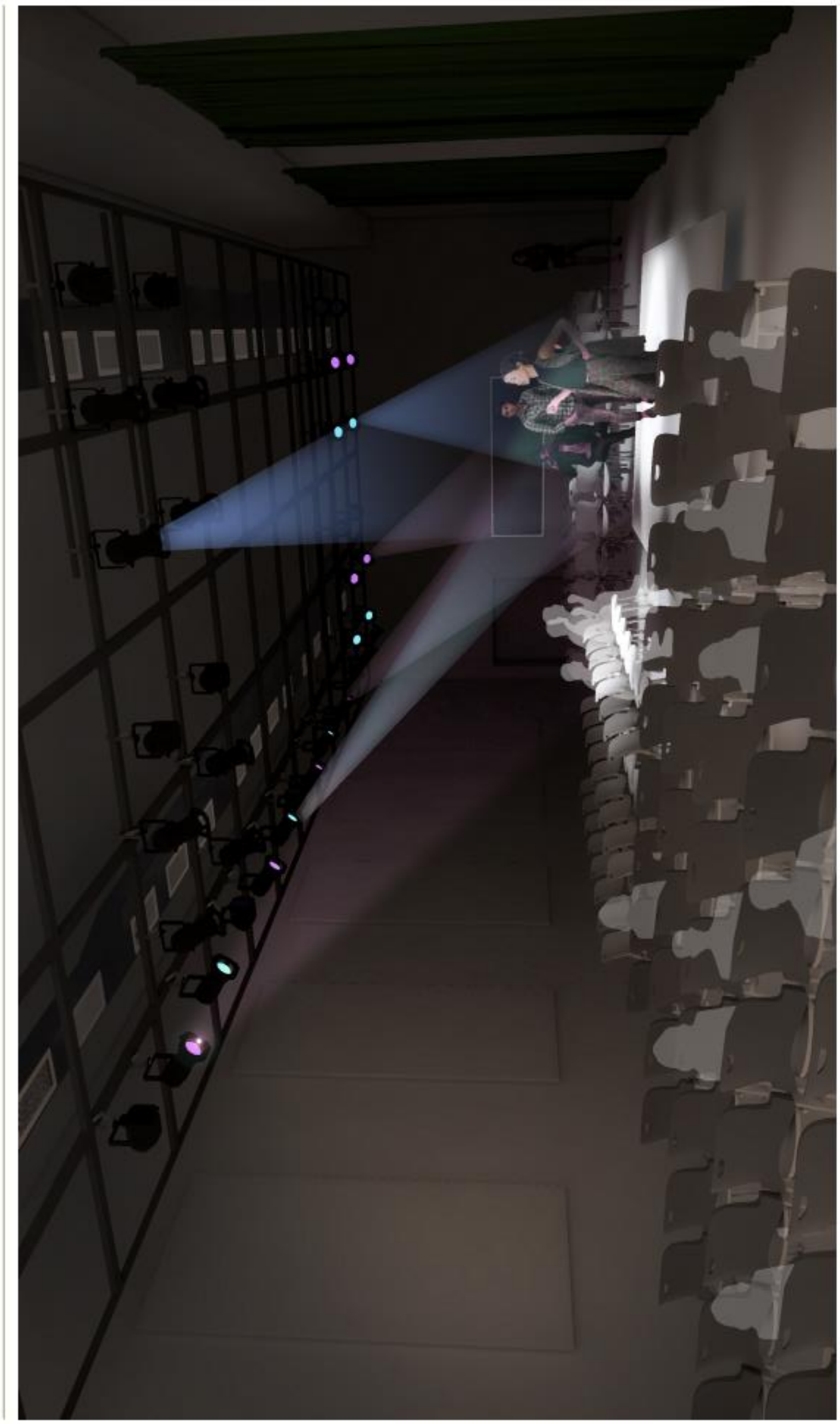
Importantly, various tangible and intangible components of the design have been informed by first-hand experiences shared by neighborhood participants (for example, the personal-safety concerns associated with long, narrow corridors).

To ensure versatility, drive consistent utilization and accommodate a range of programming (i.e. across a breadth of genres and content), the Proponent continues to engage directly with various prospective users of the space, including The Theater Offensive, the Gold Dust Orphans and Ryan Landry, the Boston Arts Academy and Fenway Health. The design team is led by Stephen Newbold at Gensler, Ernesto Bartolini at Ab Rogers Design and Stephen Martyak of StudioTyak.

The Boylston Black Box will be comprised of approx. 6,000 square feet of space. The bona fide arts and cultural performance venue will consist of a main entrance fronting on Boylston Street and a feature staircase leading to the approx. 17-foot 'double-height' space below-grade. In addition to the 120-seat theater, the program will also include 'flex' space which will be utilized for various purposes (i.e. suitable for small-group meetings, events and seminars, or alternatively, able to accommodate food & beverage catering to accompany performances).

The Proponent looks forward to continuing to partner with the LGBTQ community – and all stakeholders – to deliver the Boylston Black Box.

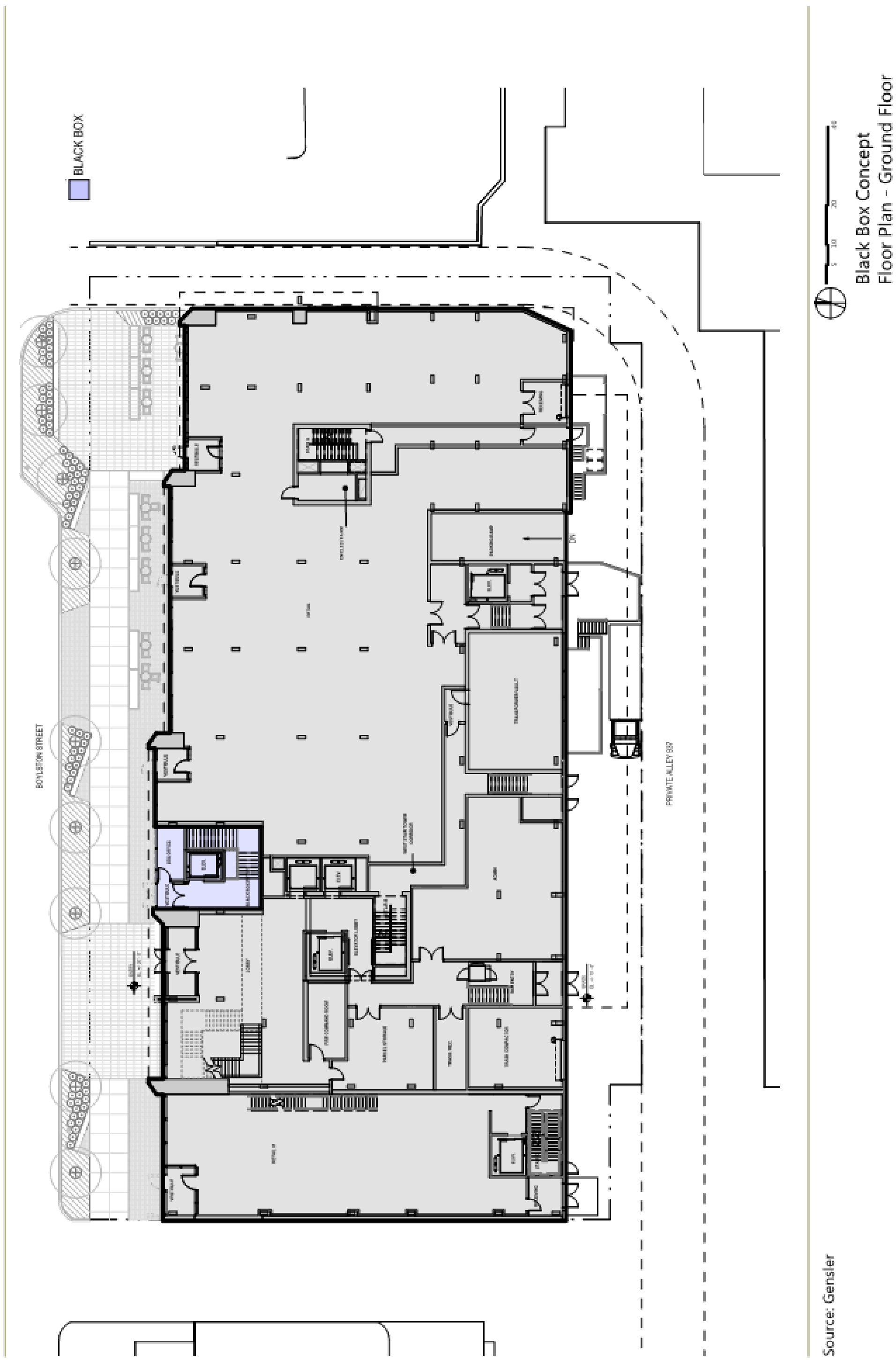
Preliminary Conceptual Design



Black Box Theater Concept Image

Source: Gensler

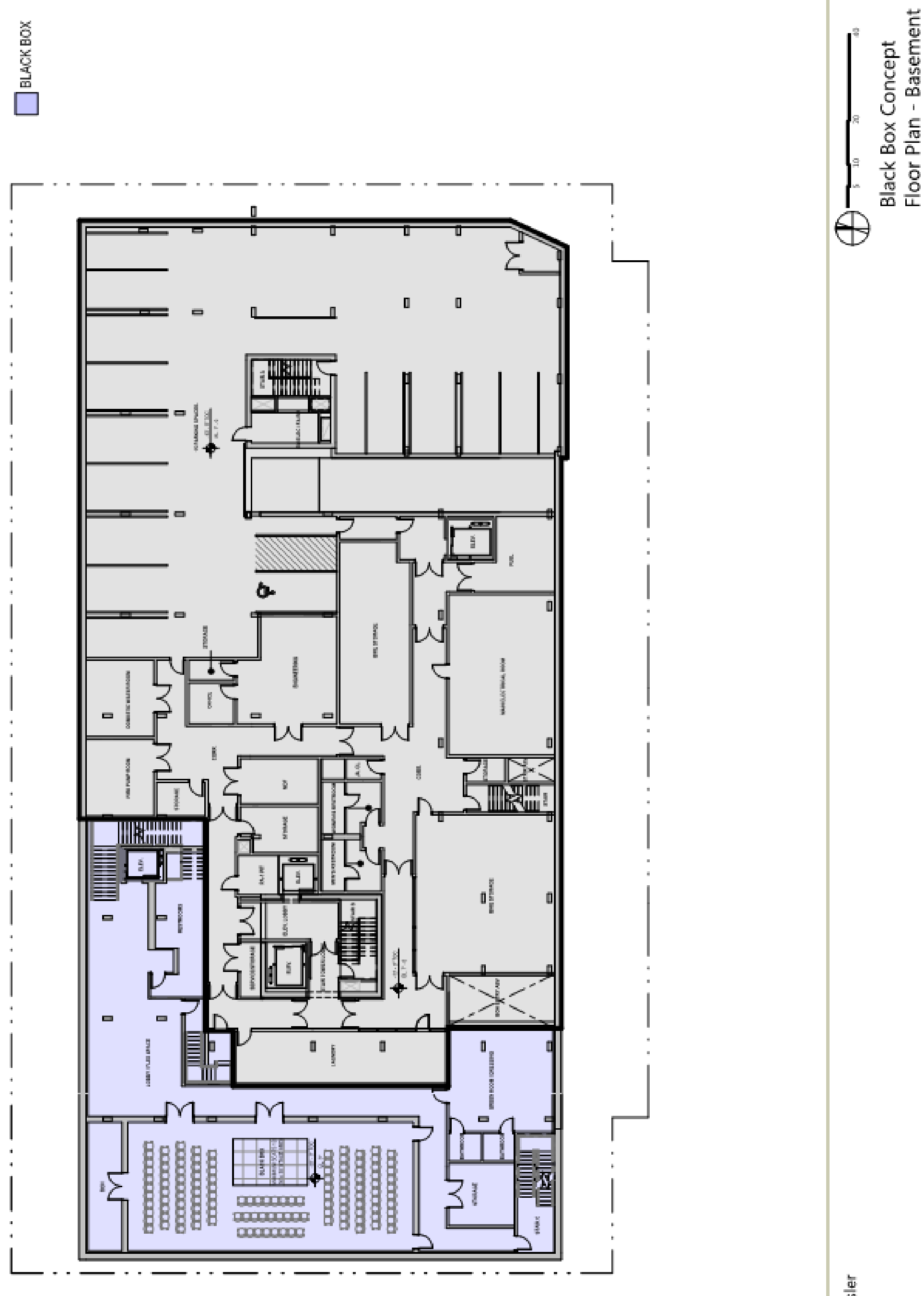
Preliminary Conceptual Design *(continued)*



Source: Gensler

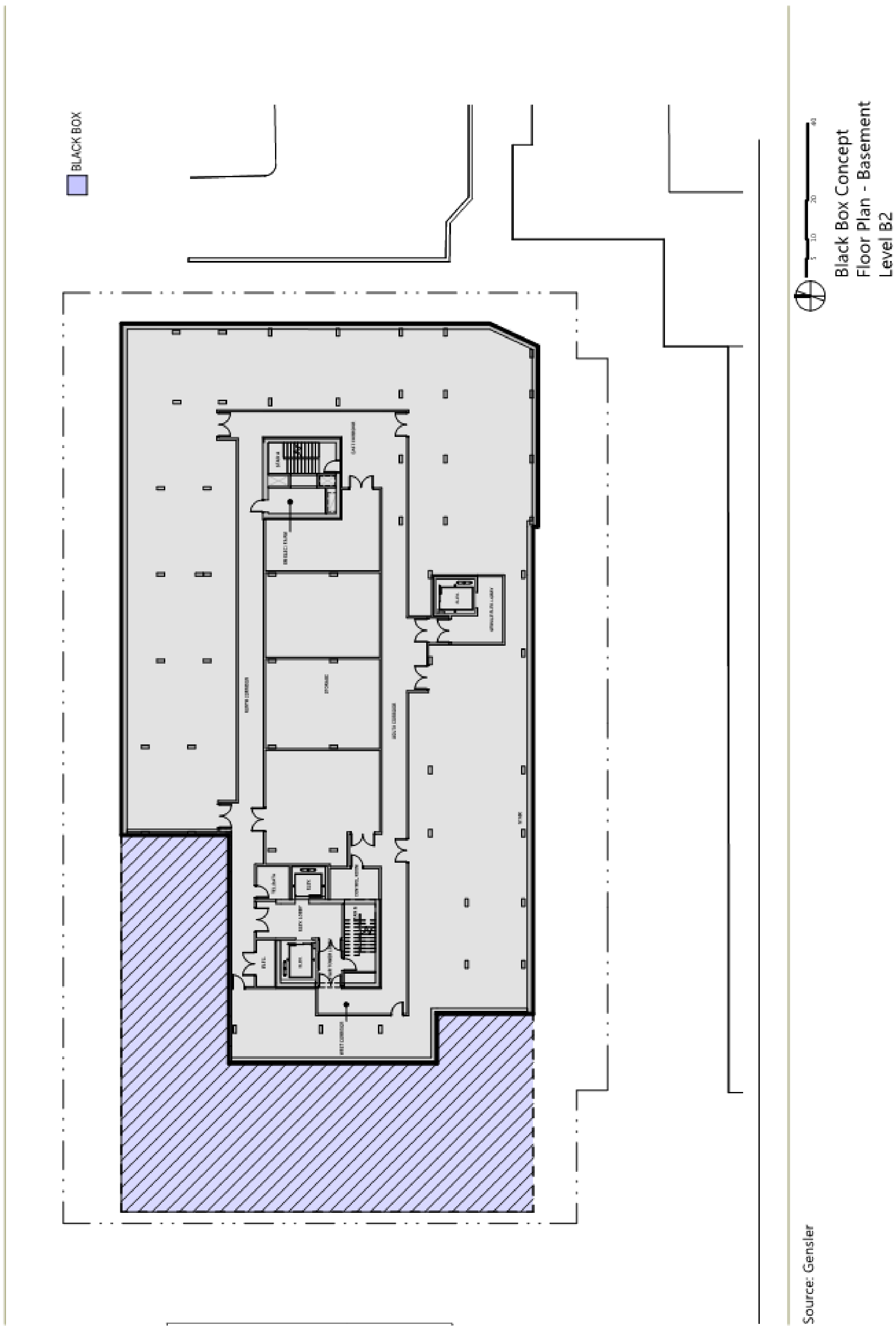
Please note, the dimensional and capacity impacts of the Boylston Black Box are not currently reflected in the calculations included herein this EPNF; as the design process progresses, the Proponent intends to update certain calculations if material impacts are anticipated; while detailed analysis is not yet complete, the Boylston Black Box may potentially increase FAR by approx. 0.10.

Preliminary Conceptual Design *(continued)*



Source: Gensler

Preliminary Conceptual Design *(continued)*



Source: Gensler

Appendix B: Letter of Intent

scape

October 31, 2018

BY HAND DELIVERY

Mr. Brian P. Golden, Director
Boston Planning & Development Agency
Boston City Hall, Ninth Floor
Boston, MA 02201

'18 OCT 31 PM3:24:48

BRA

RE: Letter of Intent to File a Project Notification Form | 1252-1268 Boylston Street

Dear Director Golden:

On behalf of Scape Boylston, LLC (the "Proponent") – an affiliate of Scape – we are pleased to respectfully submit this Letter of Intent to file a Project Notification Form (the "PNF") initiating Large Project Review under Article 80B of the Boston Zoning Code for the redevelopment of 1252-1268 Boylston Street (the "Project") in the Fenway neighborhood.

The Project will consist of approximately 205,500 square feet of mixed-use programming, comprised of approximately 500 units of private academic accommodations and an activated ground-floor retail podium fronting on Boylston Street.

The Project will serve as a beacon of innovation in the U.S. private academic accommodations sector, paralleling the model that Scape has pioneered and proven over the past decade in the U.K., Ireland and Australia. In each of its locations, Scape focuses on the power of placemaking and endeavors to deliver an integrated onsite ecosystem which allows students – graduate and undergraduate – to participate in a positive way in the neighborhoods in which they live. Scape is a long-term owner, holder and operator of its properties and its global portfolio consists of more than 12,500 beds.

Scape's entry into Boston comes at a time when the City has identified the need for 69,000 units of housing, 16,000 new undergraduate beds and 3,000 new graduate beds by 2030. The Project addresses – on a meaningful scale – the student housing challenges in Boston where an immense off-campus student population is exerting enormous pressure on the supply-constrained housing market, displacing the workforce and families, and driving-up rental costs.

Scape perceives the need for graduate academic accommodations in the Fenway neighborhood as particularly acute – and often overlooked – and, therefore, the Project will include environments to serve the graduate-level scholars driving the City's research and intellectual exploration.

Importantly, the academic accommodations component of the Project will be 'purpose-built' for students – graduate and undergraduate – of the twenty-first century. The full-service building will be operated – 24 hours per day, seven days per week – by full-time, extensively-trained, professional Scape employees. The newly constructed building will adhere to – and continue to comply with, at all times – the most current life-safety systems requirements and unit-occupancy limits. The comprehensive Scape staff will operate the building with a consistent focus on student health and wellness.

Scape selected Boston, the epicenter of American education, as its U.S. headquarters because the City embodies the Scape philosophy – that the academic population should be part of the fabric and culture of a city. Scape firmly believes that the presence of proper, thoughtfully-programmed, purpose-built academic accommodations can be accretive to an urban neighborhood and can also foster derivative impacts favorable to its residents, including the recapture of housing inventory and the creation of new permanent local jobs.

With regards to design, Scape seeks to deliver enduring – and appropriate – architecture in each of its global locations. Accordingly, the contextual design of the Project respects the commercial urban fabric delivered along the Boylston Street corridor in recent years, while also expressing the neighborhood's architectural heritage through a distinct masonry façade. The Project also consists of landscape and streetscape improvements to cultivate pedestrian activity and enhance the public realm, which is currently inhibited by the existing conditions. The Project is subject to Large

Project Review under Article 80B of the Boston Zoning Code and the Proponent will seek dimensional and use variances from the Board of Appeal. The Proponent anticipates filing the PNF within the next 30 days.

The Proponent is committed to delivering a mixed-use program that serves the long-term interests of the Fenway neighborhood. The Proponent has proactively engaged with various neighborhood stakeholders in recent months and looks forward to continuing to work closely with all parties in connection with the Project, including the broader community, the BPDA, City agencies, and the Impact Advisory Group.

Thank you very much.

Sincerely,

Nigel Taee

Global Executive Chairman

scape

Andrew Flynn

Chief Executive Officer (USA)

scape

cc: Mr. Jonathan Greeley, BPDA
Mr. Tim Czerwienski, BPDA
Mr. John Barros, Chief of Economic Development
Ms. Sheila Dillon, Chief of Housing and Director of Neighborhood Development
Ms. Yissel Guerrero, Mayor's Office of Neighborhood Services
Boston City Councilor Josh Zakim
State Senator William Brownsberger

Appendix C: BPDA Checklists

Accessibility Checklist

Climate Change Preparedness and Resiliency Checklist

Article 80 – Accessibility Checklist

A requirement of the Boston Planning & Development Agency (BPDA)
Article 80 Development Review Process

The Mayor's Commission for Persons with Disabilities strives to reduce architectural, procedural, attitudinal, and communication barriers that affect persons with disabilities in the City of Boston. In 2009, a Disability Advisory Board was appointed by the Mayor to work alongside the Commission in creating universal access throughout the city's built environment. The Disability Advisory Board is made up of 13 volunteer Boston residents with disabilities who have been tasked with representing the accessibility needs of their neighborhoods and increasing inclusion of people with disabilities.

In conformance with this directive, the BDPA has instituted this Accessibility Checklist as a tool to encourage developers to begin thinking about access and inclusion at the beginning of development projects, and strive to go beyond meeting only minimum MAAB / ADAAG compliance requirements. Instead, our goal is for developers to create ideal design for accessibility which will ensure that the built environment provides equitable experiences for all people, regardless of their abilities. As such, any project subject to Boston Zoning Article 80 Small or Large Project Review, including Institutional Master Plan modifications and updates, must complete this Accessibility Checklist thoroughly to provide specific detail about accessibility and inclusion, including descriptions, diagrams, and data.

For more information on compliance requirements, advancing best practices, and learning about progressive approaches to expand accessibility throughout Boston's built environment. Proponents are highly encouraged to meet with Commission staff, prior to filing.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
   http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Massachusetts State Building Code 780 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html
4. Massachusetts Office of Disability – Disabled Parking Regulations
   http://www.mass.gov/anf/docs/mod/hp-parking-regulations-summary-mod.pdf
5. MBTA Fixed Route Accessible Transit Stations
   http://www.mbta.com/riding_the_t/accessible_services/
6. City of Boston – Complete Street Guidelines
   http://bostoncompletestreets.org/
7. City of Boston – Mayor's Commission for Persons with Disabilities Advisory Board
   www.boston.gov/disability
8. City of Boston – Public Works Sidewalk Reconstruction Policy
   http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
9. City of Boston – Public Improvement Commission Sidewalk Café Policy
   http://www.cityofboston.gov/images_documents/Sidewalk_cafes_tcm3-1845.pdf

Glossary of Terms:

1. *Accessible Route* – A continuous and unobstructed path of travel that meets or exceeds the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 20
2. *Accessible Group 2 Units* – Residential units with additional floor space that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 9.4
3. *Accessible Guestrooms* – Guestrooms with additional floor space, that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 8.4
4. *Inclusionary Development Policy (IDP)* – Program run by the BPDA that preserves access to affordable housing opportunities, in the City. For more information visit: http://www.bostonplans.org/housing/overview
5. *Public Improvement Commission (PIC)* – The regulatory body in charge of managing the public right of way. For more information visit: https://www.boston.gov/pic
6. *Visitability* – A place's ability to be accessed and visited by persons with disabilities that cause functional limitations; where architectural barriers do not inhibit access to entrances/doors and bathrooms.

1. Project Information *If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.*			
Project Name:	1252-1270 Boylston		
Primary Project Address:	1252-1270 Boylston Street, Boston, MA 02215		
Total Number of Phases/Buildings:	1		
Primary Contact (Name / Title / Company / Email / Phone):	Andrew Flynn Chief Executive Officer Scape USA (857) 205 - 4575 Andrew.Flynn@Scape.com		
Owner / Developer:	Scape Boylston, LLC		
Architect:	Gensler		
Civil Engineer:	VHB		
Landscape Architect:	Copley Wolff Design Group		
Permitting:	VHB		
Construction Management:	Suffolk Construction		
At what stage is the project at time of this questionnaire? Select below:			
	PNF / **Expanded PNF Submitted**	Draft / Final Project Impact Report Submitted	BPDA Board Approved
	BPDA Design Approved	Under Construction	Construction Completed:
Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? *If yes,* identify and explain.	Private Alley 937: Accessible Lift: The South entry from Private Alley 937 into the Residence's Back of House spaces is served by an accessible lift. This secondary access to the building has an elevation differential of approximately 7'-0" from grade to the Ground Floor. The Project is currently planning to provide an internal ADA Lift in the vestibule in lieu of an external ramp. The external ramp would have to be approximately 110'-0' in length to accommodate the ramp and associated landings. The ramp area required would be in conflict with the service of the building, including the loading dock, trash compactor and service, and utility Transformer vault. The areas that are served by this lift also have a fully accessible front entry access through Residence Lobby off of Boylston Street.		

<table>
<tr><td colspan="5">2. Building Classification and Description:
This section identifies preliminary construction information about the project including size and uses.</td></tr>
<tr><td colspan="5">What are the dimensions of the project? The Site is approximately 240’-0” by 141’-0”.</td></tr>
<tr><td>Site Area:</td><td>33,585 SF</td><td colspan="2">Building Area:</td><td>235,095 GSF</td></tr>
<tr><td>Building Height:</td><td>175’-0” FT.</td><td colspan="2">Number of Stories:</td><td>15 Flrs.</td></tr>
<tr><td>First Floor Elevation:</td><td>EL 20’-0”</td><td colspan="2">Is there below grade space:</td><td>Yes / No</td></tr>
<tr><td colspan="5">What is the Construction Type? (Select most appropriate type)</td></tr>
<tr><td></td><td>Wood Frame</td><td>Masonry</td><td>Steel Frame</td><td>Concrete</td></tr>
<tr><td colspan="5">What are the principal building uses? (IBC definitions are below – select all appropriate that apply)</td></tr>
<tr><td rowspan="3"></td><td>Residential – One - Three Unit</td><td>Per IBC Group R2 – Non-Transient residential Occupancy most closely resembles a dormitory or extended Stay Hotel</td><td>Institutional</td><td>Educational</td></tr>
<tr><td>Business</td><td>Mercantile</td><td>Factory</td><td>Hospitality</td></tr>
<tr><td>Laboratory / Medical</td><td>Storage, Utility and Other</td><td></td><td></td></tr>
<tr><td>List street-level uses of the building:</td><td colspan="4">Retail, Entry Lobby for Private Accommodations (Dormitory) and associated back of house spaces and Service.</td></tr>
<tr><td colspan="5">3. Assessment of Existing Infrastructure for Accessibility:
This section explores the proximity to accessible transit lines and institutions, such as (but not limited to) hospitals, elderly & disabled housing, and general neighborhood resources. Identify how the area surrounding the development is accessible for people with mobility impairments and analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.</td></tr>
<tr><td>Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:</td><td colspan="4">The Project Site consists of two parcels: 1252-1268 Boylston Street; and 1270 Boylston Street. The grade of the Project Site is essentially level along Boylston Street at approximately BCB Elevation 20’-0.” There is an approximate 7’-0” downward slope to the rear side along Private Alley 937 to approximately BCB elevation 13’-0”. The full streetscape along Boylston street will be made accessible.</td></tr>
<tr><td>List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:</td><td colspan="4">Commuter Rail: Framingham / Worcester Line (Yawkey Way) 0.3 miles
MBTA Green Line: Kenmore Station 0.3 Miles, Fenway 0.4 miles
MBTA Bus: 55 Ipswich Street 355’
MBTA Bus: 8, 9, 19, 60, 65 0.2 Miles</td></tr>
<tr><td>List the surrounding institutions: hospitals, public housing, elderly and disabled housing</td><td colspan="4">Massachusetts School of Pharmacy and Health, Fenway Park, Museum of Fine Arts, Isabella Gardner Museum, Berklee College of Music, Boston University, Simmons College, Emmanuel College, Northeastern University,</td></tr>
</table>

developments, educational facilities, others:	Harvard Medical School, Massachusetts College of Art & Design, Wentworth Institute of Technology, West Fenway Elderly Housing, Beth Israel Deaconess Medical Center, Boston Children's Hospital, Brigham and Women's Hospital
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	Fenway Community Center, The Fens, City of Boston Fire Department, Massachusetts Historical Society, Ramler Park

4. Surrounding Site Conditions – Existing:

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

Is the development site within a historic district? ***If yes,*** identify which district:	No
Are there sidewalks and pedestrian ramps existing at the development site? ***If yes***, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	There is an existing sidewalk that runs east-west on Boylston Street. All of the sidewalks and access ramps will be replaced as part of the Project to meet accessibility requirements
Are the sidewalks and pedestrian ramps existing-to-remain? ***If yes,*** have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? ***If yes,*** provide description and photos:	No

5. Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? *If yes*, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	Yes. The proposed sidewalk meets Boston Complete Streets Design Guidelines 2013. Street type "Downtown Mixed-Use" was applied.
What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	The sidewalk is a total of 232'-6" long and ranges from 23'-11" to 34'-7" wide. There is a cross-slope of no more than 2%. Frontage zones range from 6'-8" to 14'-4" wide. Pedestrian zone is 10'-0" wide. Furnishing zone is 7'-3" wide.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	The Frontage zone is on private property and will consist of precast concrete pavers. The Pedestrian zone is on Private Property and will consist of 6" thick cast in place concrete paving. The Furnishing zone is in the City of Boston pedestrian right-of-way and consists of precast concrete pavers and angled steel planters with wood bench seating. There are two areas, at the main residences entrance and the eastern end of the Project Site, both made up of 1x2 granite pavers. These areas transcend all three zones.
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? *If yes,* what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?	Yes. The remaining right-of-way clearance will be at least 10'-0"
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	The pedestrian right-of-way is on private property and the Proponent will not be seeking a pedestrian easement. The proponent plans to maintain the pedestrian right of way via the License, Maintenance, and Indemnification (LMI) agreement with PIC.

<table>
<tr><td>Will any portion of the Project be going through the PIC? If yes, identify PIC actions and provide details.</td><td>The Project street frontage on Boylston Street will be reviewed by PIC, for approval of review materials, street furniture and trees, and bicycle and pedestrian accommodations via a Specific Repairs review and LMI.</td></tr>
<tr><td colspan="2">6. Accessible Parking:
See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations.</td></tr>
<tr><td>What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?</td><td>Approximately 15 spaces will be provided below grade, which will replace the existing surface parking on-site.</td></tr>
<tr><td>What is the total number of accessible spaces provided at the development site? How many of these are “Van Accessible” spaces with an 8 foot access aisle?</td><td>Total number TBD. Accessible space will be provided and will be van accessible.</td></tr>
<tr><td>Will any on-street accessible parking spaces be required? If yes, has the proponent contacted the Commission for Persons with Disabilities regarding this need?</td><td>The Proponent will maintain five (5) of the existing on-street metered parking spaces. The Proponent will contact the Commission for Persons with Disabilities regarding the need for accessible parking spaces.</td></tr>
<tr><td>Where is the accessible visitor parking located?</td><td>No visitor parking provided.</td></tr>
<tr><td>Has a drop-off area been identified? If yes, will it be accessible?</td><td>There is a new drop-off area proposed in front of the residence lobby entry. The drop-off area will be made accessible.</td></tr>
<tr><td colspan="2">7. Circulation and Accessible Routes:
The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability-with neighbors.</td></tr>
<tr><td>Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:</td><td>Retail Entries:
Retail Entries on Boylston Street are all flush conditions
Scape Entries:
Main Entry on Boylston Street is flush condition
Rear Entry on Private Alley 937 has stairs and lift
Private Alley 937 Service Entry:
Service Entry and loading dock on Private Alley 937 is accessed via stairs</td></tr>
</table>

Are the accessible entrances and standard entrance integrated? *If yes, describe. If no,* what is the reason?	The standard entrances and accessible entrances are at the same location
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	Code-compliant life safety and accessibility signage will be provided for the Project.

8. Accessible Units (Group 2) and Guestrooms: (If applicable)

In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.

What is the total number of proposed housing units or hotel rooms for the development?	533 units
If a residential development, how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units?	533 units are provided as rentable for 51 week stays and are not applicable to the IDP.
If a residential development, how many accessible Group 2 units are being proposed?	five percent of the units will be provided as Group 2A Units.
If a residential development, how many accessible Group 2 units will also be IDP units? *If none*, describe reason.	Not Applicable
If a hospitality development, how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? *If yes,* provide amount and location of equipment.	Not Applicable
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. *If yes*, provide reason.	Entry to units do not have stairs, thresholds etc. The standard unit entry doors are provided with accessible push clearance but not pull clearance as permitted by Federal Housing Act.
Are there interior elevators, ramps or lifts located in the development	Yes. Elevators are located on the Ground Floor.

for access around architectural barriers and/or to separate floors? *If yes*, describe:	
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community.*	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	Not identified at this time.
What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	All indoor and outdoor amenity spaces will be fully accessible.
Are any restrooms planned in common public spaces? *If yes,* will any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? *If no*, explain why not.	The amenity level on the Second Floor includes four individual restrooms. Two of these restrooms will be fully ADA compliant.
Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? *If yes,* did they approve? *If no,* what were their comments?	No. Review to be scheduled.
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? *If no,* what recommendations did	No. Review to be scheduled.

the Advisory Board give to make this project more accessible?	

10. Attachments

Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project.

Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances. Refer to Figures B.1 and B.2.
Provide a diagram of the accessible route connections through the site, including distances. Refer to Figure B.3.
Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) Refer to Figure B.4.
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. Refer to Figures B.5 through B.7.
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project. • • • •

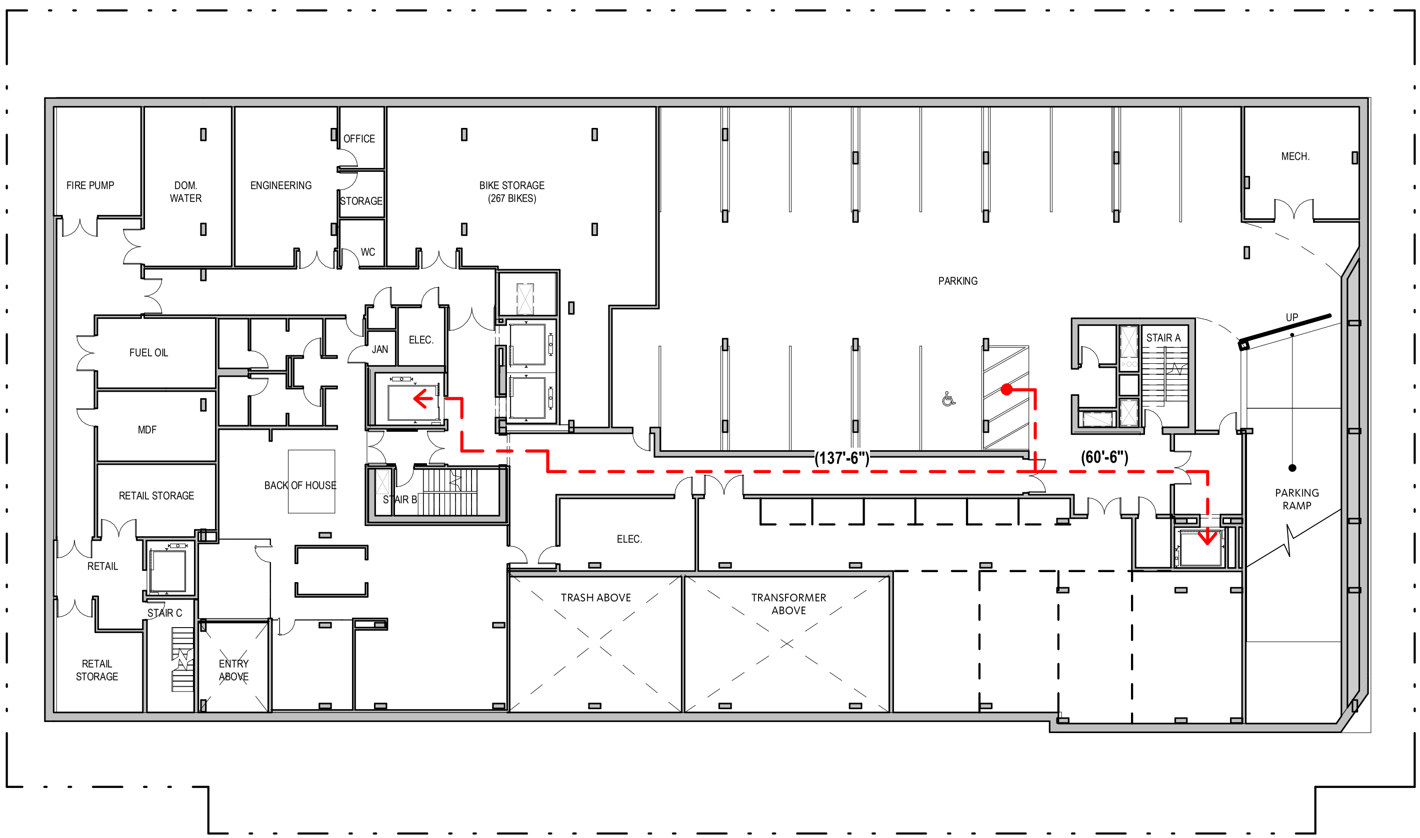
This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

For questions or comments about this checklist, or for more information on best practices for improving accessibility and inclusion, visit www.boston.gov/disability, or our office:

The Mayor's Commission for Persons with Disabilities
1 City Hall Square, Room 967,
Boston MA 02201.

Architectural Access staff can be reached at:

accessibility@boston.gov | patricia.mendez@boston.gov | sarah.leung@boston.gov | 617-635-3682



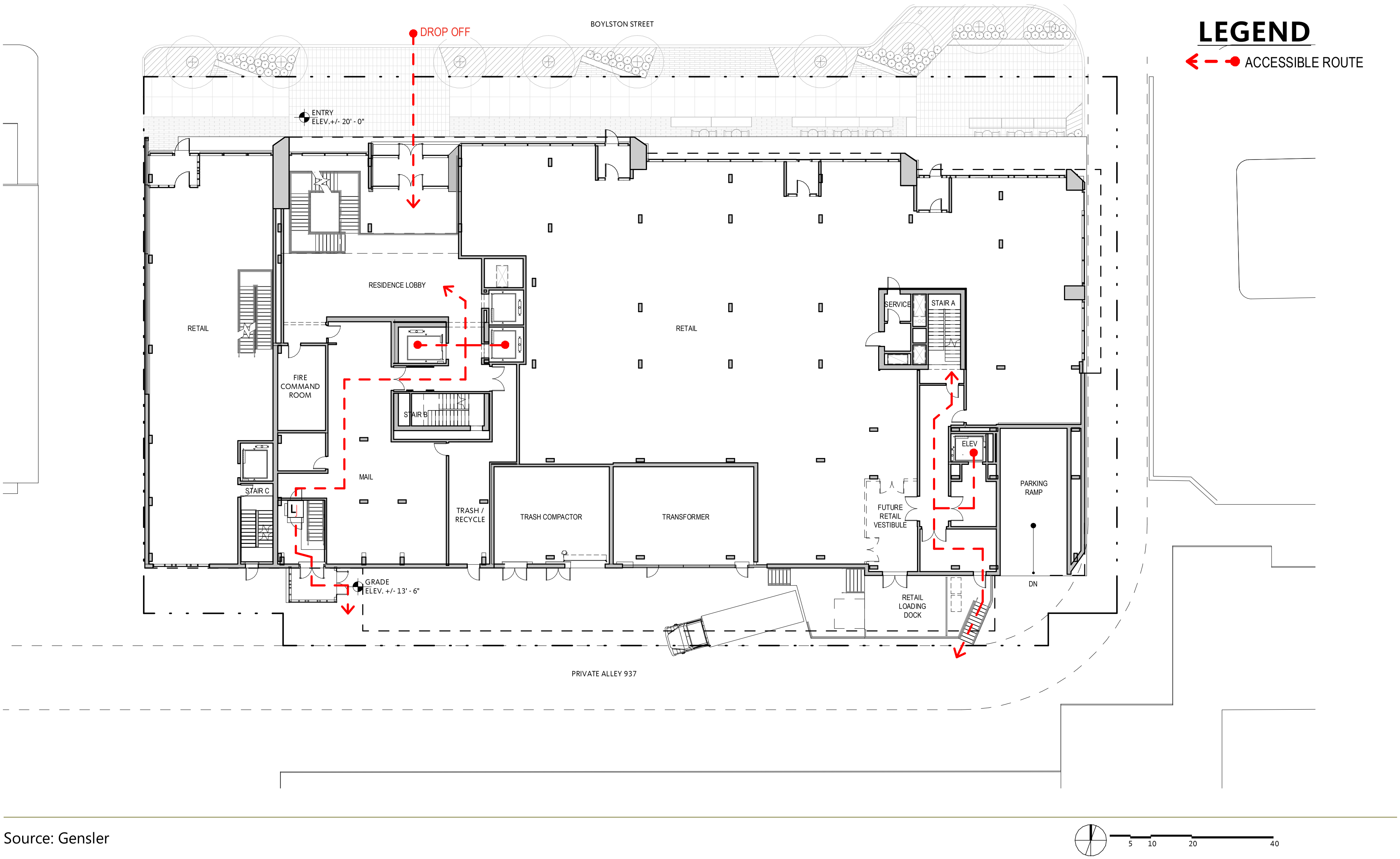
LEGEND

ACCESSIBLE ROUTE

Source: Gensler

Figure B.1
Accessibility Route
Parking & Drop Off to Entry
Basement Level B1

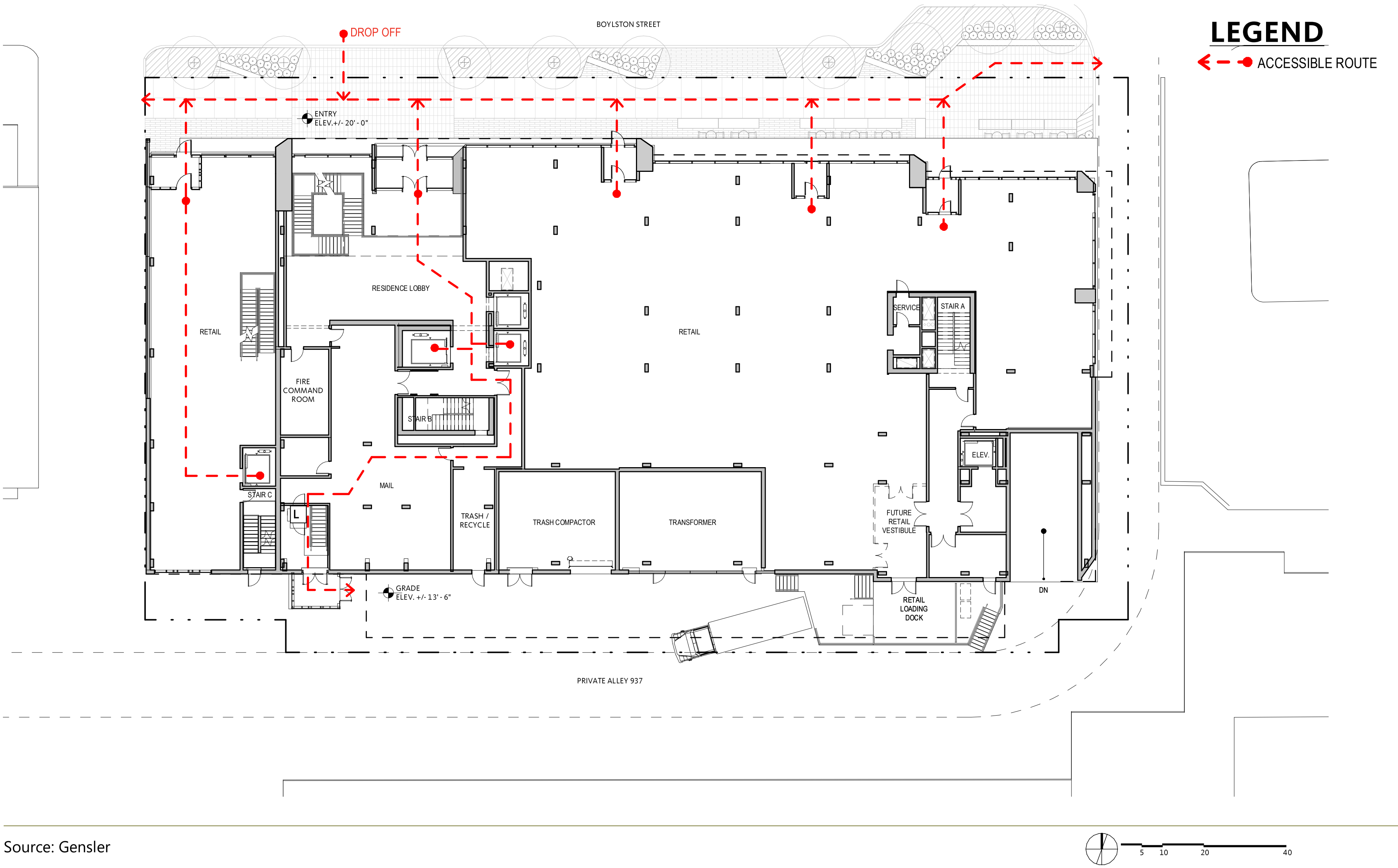
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure B.2
Accessibility Route
Parking & Drop-Off to Entry
Ground Floor

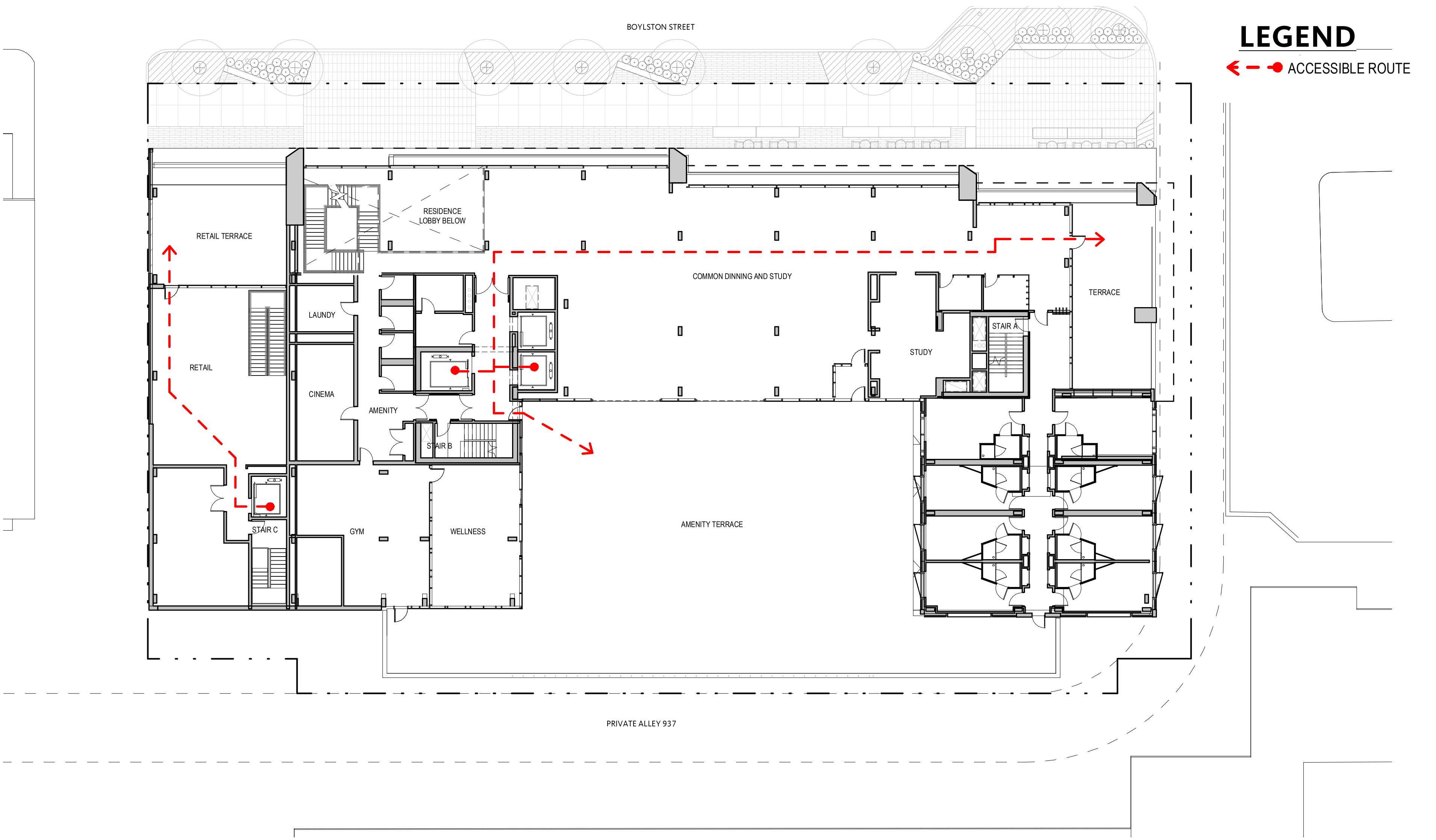
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure B.3
Accessibility Route Site
Ground Floor

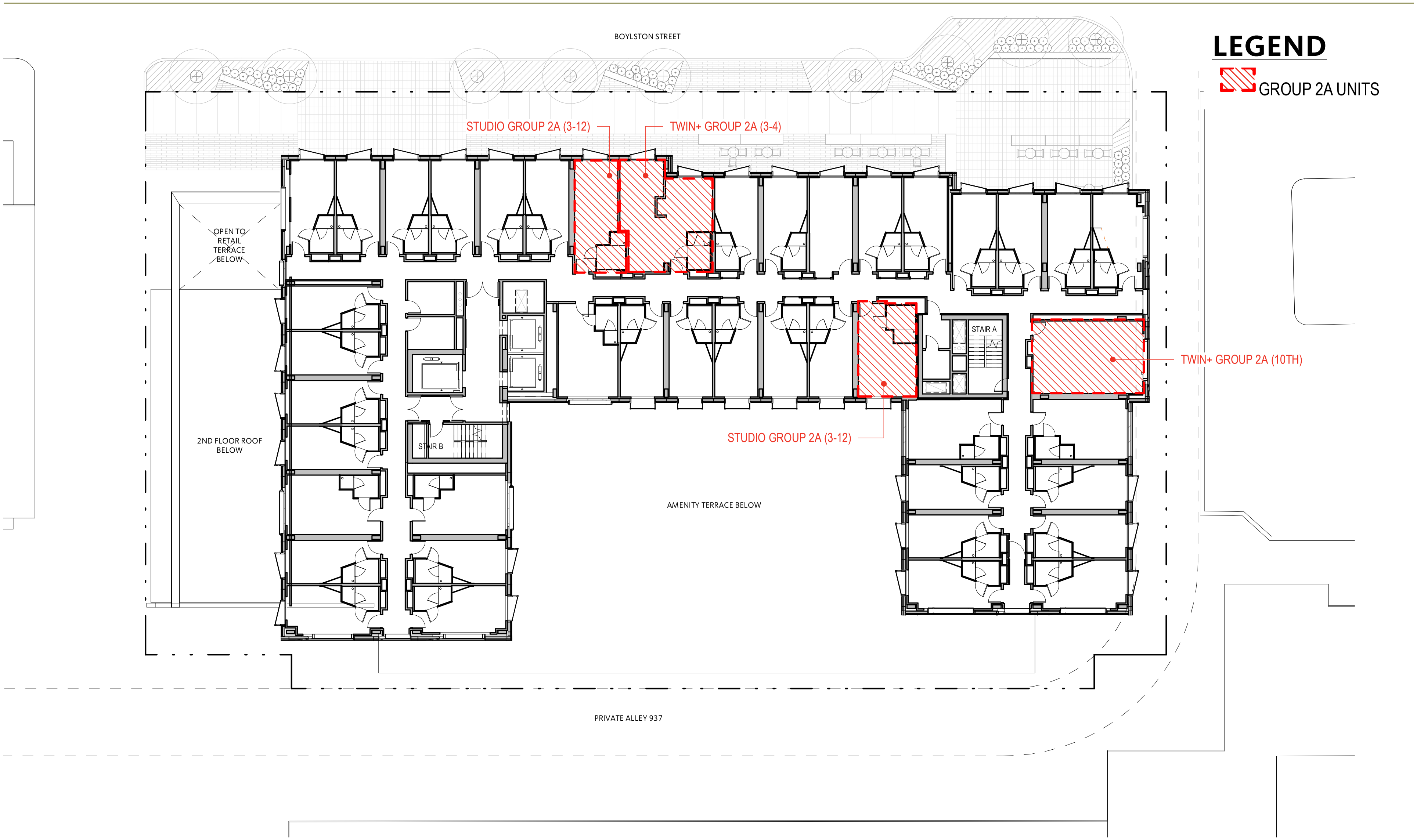
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure B.4
Accessibility Route Terraces
Level 2

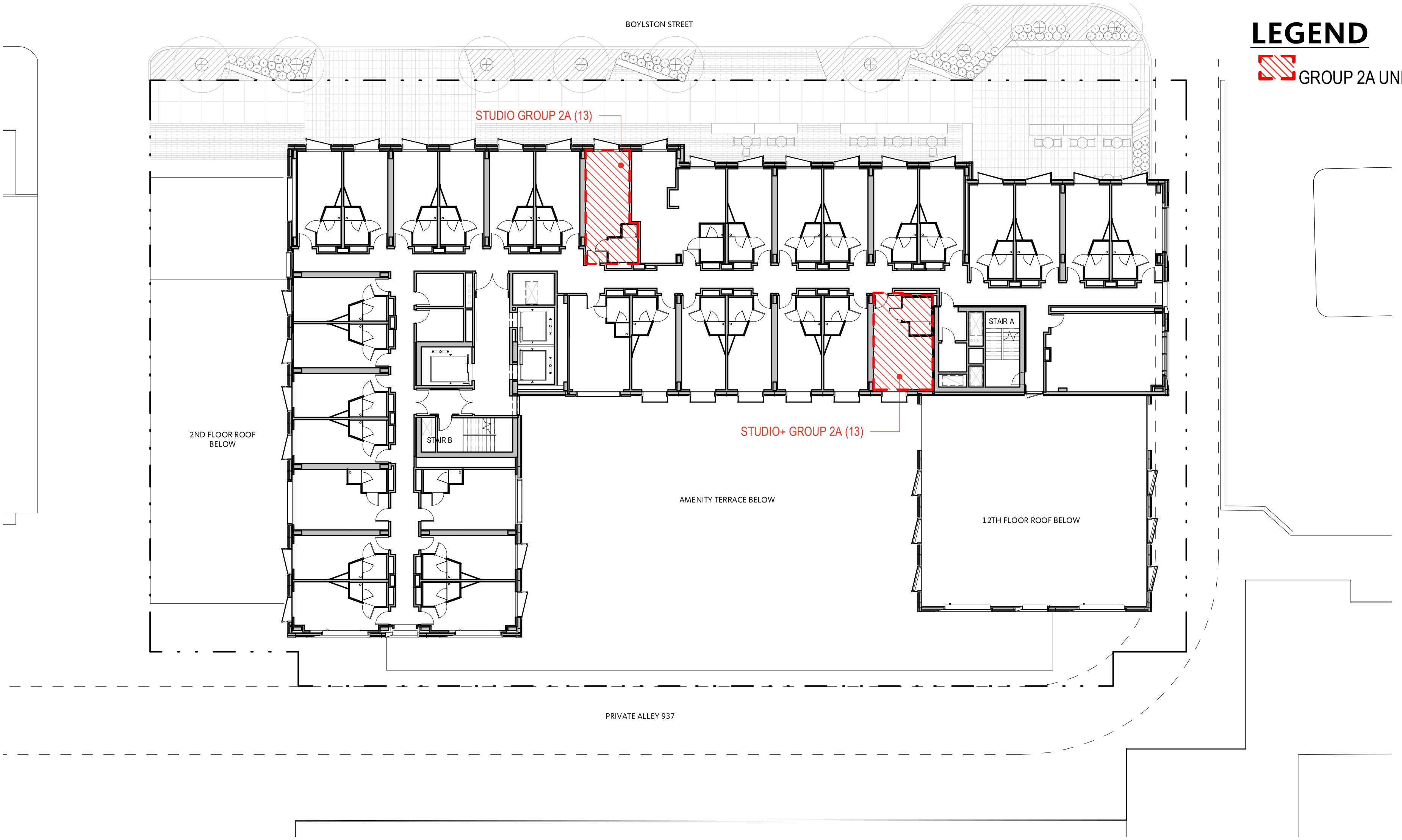
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure B.5
Accessible Units
Levels 3-12

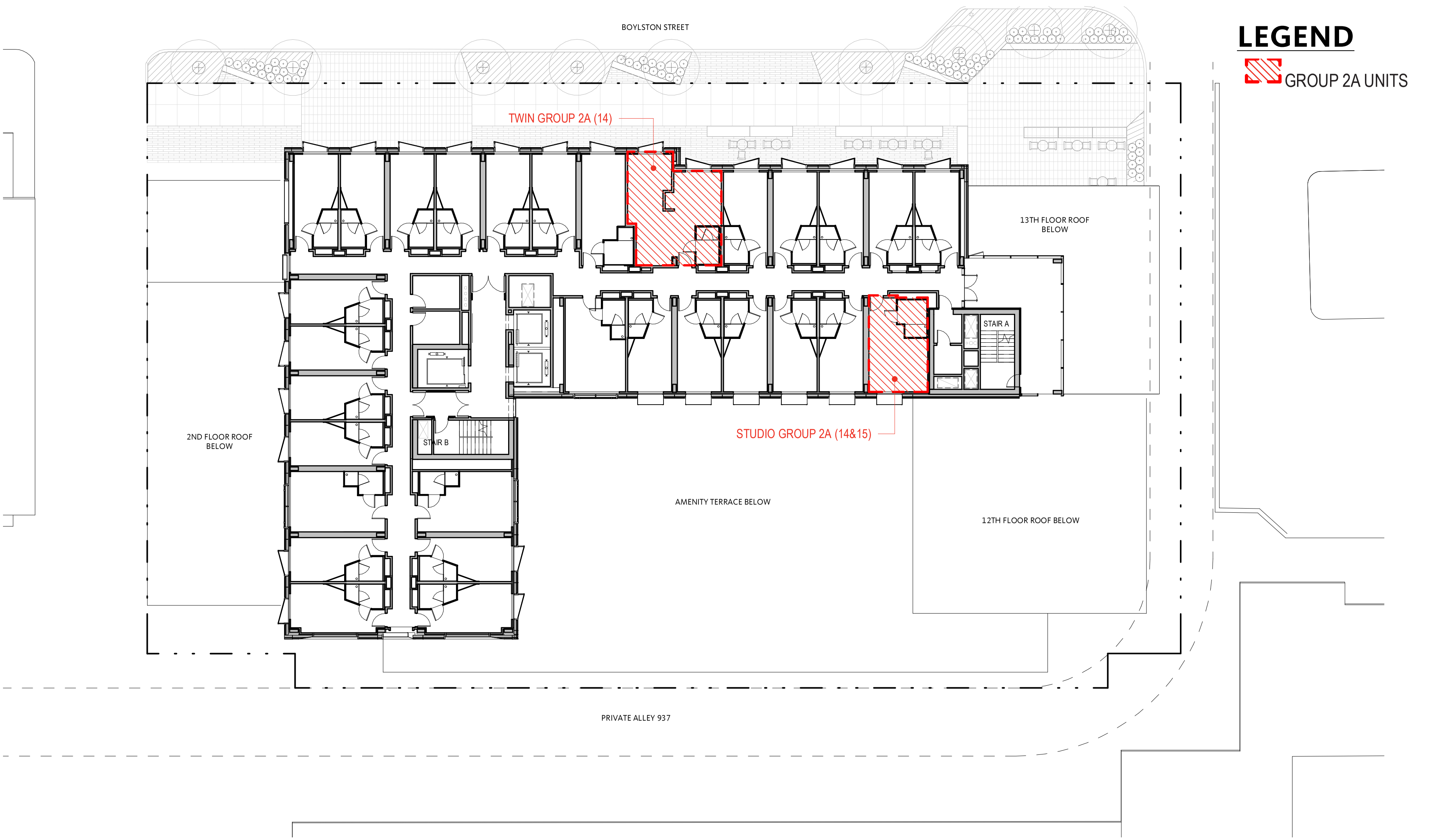
1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure B.6
Accessible Units
Levels 13

1252-1270 Boylston
Boston, Massachusetts



Source: Gensler

Figure B.7
Accessibile Units
Levels 14-15

1252-1270 Boylston
Boston, Massachusetts

boston planning & development agency

Climate Resiliency Checklist

NOT FOR FILING

NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

A.1 - Project Information

Project Name:	1252-1270 Boylston			
Project Address:	1252-1270 Boylston Street, Boston, MA 02215			
Project Address Additional:				
Filing Type (*select*)	*Initial (PNF,* **EPNF**, *NPC or other substantial filing)* *Design / Building Permit (prior to final design approval), or* *Construction / Certificate of Occupancy (post construction completion)*			
Filing Contact	Andrew Flynn	Scape Boylston, LLC	Andrew. Flynn@Scape.com	
Is MEPA approval required	*Yes/*No		*Date* N/A	

A.3 - Project Team

Owner / Developer:	Scape Boylston, LLC
Architect:	Gensler
Engineer:	VHB
Sustainability / LEED:	WSP
Permitting:	VHB
Construction Management:	Suffolk Construction

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Private Academic Accommodations (Dormitory), Retail, General Storage.
List the First Floor Uses:	Retail, Entry Lobby for Private Academic Accommodations (Dormitory) and associated back of house spaces and Service.
List any Critical Site Infrastructure and or Building Uses:	Building Transformer Vault

Site and Building:

Site Area:	33,585 SF	Building Area:	235,095 SF
Building Height:	175 Ft	Building Height:	15 Stories
Existing Site Elevation – Low:	12.40 Ft BCB	Existing Site Elevation – High:	20.90 Ft BCB
Proposed Site Elevation – Low:	12.40 Ft BCB	Proposed Site Elevation – High:	20.90 Ft BCB
Proposed First Floor Elevation:	20.0 Ft BCB	Below grade levels:	2 Stories

Article 37 Green Building: :

LEED Version - Rating System :	LEED v4 - NC	LEED Certification:	Yes
Proposed LEED rating:	Silver	Proposed LEED point score:	50 Pts.

Building Envelope:

When reporting R values, differentiate between R discontinuous and R continuous. For example, use “R13” to show R13 discontinuous and use R10c.i. to show R10 continuous. When reporting U value, report total assembly U value including supports and structural elements.

Roof:	R30 c.i.(R)	Exposed Floor:	12.5 c.i.(R)
Foundation Wall:	7.5c.i. (R)	Slab Edge (at or below grade):	10 (R)

Vertical Above-grade Assemblies (%’s are of total vertical area and together should total 100%):

Area of Opaque Curtain Wall & Spandrel Assembly:	11 (%)	Wall & Spandrel Assembly Value:	.055 (U)
Area of Framed & Insulated / Standard Wall:	57(%)	Wall Value	20 (R)
Area of Vision Window:	31%	Window Glazing Assembly Value:	.38 (U)
		Window Glazing SHGC:	.39 (SHGC)
Area of Doors:	1 %	Door Assembly Value:	0.37 (U)

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	eQuest energy modeling: Proposed design vs ASHRAE 90.1-2013 App. G baseline with MA Amendments		
Annual Electric:	2,169,059 (kWh)	Peak Electric:	2,800 (kW)
Annual Heating:	3,987 (MMbtu)	Peak Heating:	6.0 (MMbtu/hr)
Annual Cooling:	295,655 (Tons/hr)	Peak Cooling:	500 (Tons)
Energy Use - Below ASHRAE 90.1 - 2013:	30%	Have the local utilities reviewed the building energy performance?:	Not yet
Energy Use - Below Mass. Code:	26 %	Energy Use Intensity:	37 (kBtu/SF)

Back-up / Emergency Power System

Electrical Generation Output:	500 (kW)	Number of Power Units:	1
System Type:	Combustion Engine	Fuel Source:	Diesel

Emergency and Critical System Loads (in the event of a service interruption)

Electric:	300 (kW)	Heating:	0.14 (MMbtu/hr)
		Cooling:	6 (Tons)

B – Greenhouse Gas Reduction and Net Zero / Net Positive Carbon Building Performance

Reducing GHG emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon neutrality by 2050 new buildings performance will need to progressively improve to net carbon zero and positive.

B.1 – GHG Emissions - Design Conditions

For this Filing - Annual Building GHG Emissions: 1,004 (Tons)

For this filing - describe how building energy performance has been integrated into project planning, design, and engineering and any supporting analysis or modeling:

> Energy modeling will be utilized throughout the process of the design. The design options will be analyzed for energy savings and energy cost savings at 50% DD and 100% CD.

Describe building specific passive energy efficiency measures including orientation, massing, envelop, and systems:

> The building will be designed to minimize window-to-wall ratio below 40%. The east, west, and south facades will include 30% glass, while the north façade will have 35% glass.
>
> There will be two types of glass installed within the Project. Type one will have a U-value of 0.35, while type 2 will have a U-value of 0.40. Both types exceed code. Exterior wall performance will also exceed code.

Describe building specific active energy efficiency measures including equipment, controls, fixtures, and systems:

> HVAC equipment will be designed to maximize efficiency and exceed code standard. The design will include high-performance water-source heat pumps with EC motors in each unit.
> Energy Recovery has been included to incorporate energy and waste-heat savings.
> High performance fixtures such as LED will be installed throughout the Project.
> Occupancy sensors will be applied throughout the building.
> Lighting controls will enable controllability and energy savings throughout.
> Energy efficient condensing water heaters will provide domestic hot water throughout the building. Domestic water fixtures will be low-flow
> Energy Star appliances will be specified where applicable.

Describe building specific load reduction strategies including on-site renewable, clean, and energy storage systems:

> Currently, these systems are being reviewed for inclusion into the design. The design team is currently investigating Combined Heat & Power (CHP) and PV array systems.

Describe any area or district scale emission reduction strategies including renewable energy, central energy plants, distributed energy systems, and smart grid infrastructure:

> This is stand-alone building.

Describe any energy efficiency assistance or support provided or to be provided to the project:

> The owner plans to take advantage of all local utility rebate programs provided by Eversource and National Grid.

B.2 - GHG Reduction - Adaptation Strategies

Describe how the building and its systems will evolve to further reduce GHG emissions and achieve annual carbon net zero and net positive performance (e.g. added efficiency measures, renewable energy, energy storage, etc.) and the timeline for meeting that goal (by 2050):

> The building will utilize water-source heat pumps systems that primary use electricity for heating and cooling. This will allow the building to take advantage of available green power today and a better source efficiency as the grid becomes more efficient.

C - Extreme Heat Events

Annual average temperature in Boston increased by about 2˚F in the past hundred years and will continue to rise due to climate change. By the end of the century, the average annual temperature could be 56° (compared to 46° now) and the number of days above 90° (currently about 10 a year) could rise to 90.

C.1 – Extreme Heat - Design Conditions

Temperature Range - Low:	0 Deg.	Temperature Range - High:	100 Deg.
Annual Heating Degree Days:	5,541	Annual Cooling Degree Days	2,897

What Extreme Heat Event characteristics will be / have been used for project planning

Days - Above 90°:	9	Days – Above 100°:	5
Number of Heatwaves / Year:	3	Average Duration of Heatwave (Days):	3

Describe all building and site measures to reduce heat-island effect at the site and in the surrounding area:

> White roof and potentially vegetated roof

C.2 - Extreme Heat – Adaptation Strategies

Describe how the building and its systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heatwaves, and longer heatwaves:

> The building will include high performance heating, cooling, and ventilation, lighting controls, building system controls, healthy/resilient materials, and energy recovery.

Describe all mechanical and non-mechanical strategies that will support building functionality and use during extended interruptions of utility services and infrastructure including proposed and future adaptations:

> The building will be provided with emergency generator sized for life safety systems.

D - Extreme Precipitation Events

From 1958 to 2010, there was a 70 percent increase in the amount of precipitation that fell on the days with the heaviest precipitation. Currently, the 10-Year, 24-Hour Design Storm precipitation level is 5.25”. There is a significant probability that this will increase to at least 6” by the end of the century. Additionally, fewer, larger storms are likely to be accompanied by more frequent droughts.

D.1 – Extreme Precipitation - Design Conditions

10 Year, 24 Hour Design Storm: 4.90 In. per NRCC Atlas 14

Describe all building and site measures for reducing storm water run-off:

The Project Site will utilize subsurface infiltration systems to comply with requirements of BWSC and the GCOD, but also to detain and reduce stormwater runoff.

D.2 - Extreme Precipitation - Adaptation Strategies

Describe how site and building systems will be adapted to efficiently accommodate future more significant rain events (e.g. rainwater harvesting, on-site storm water retention, bio swales, green roofs):

The building roof will be drained directly to subsurface infiltration. Additionally, the Project is providing larger green areas within the streetscape on Boylston Street than is typical in this part of the Fenway Area, along with some pervious pavers.

E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, sea levels in Boston will continue to rise throughout the century. This will increase the number of buildings in Boston susceptible to coastal flooding and the likely frequency of flooding for those already in the floodplain.

Is any portion of the site in a FEMA SFHA? *Yes / No*

What Zone:

Current FEMA SFHA Zone Base Flood Elevation: *Ft BCB*

Is any portion of the site in a BPDA Sea Level Rise - Flood Hazard Area? Use the online BPDA SLR-FHA Mapping Tool to assess the susceptibility of the project site. *Yes / No*

If you answered YES to either of the above questions, please complete the following questions.
Otherwise you have completed the questionnaire; thank you!

E.1 – Sea Level Rise and Storms – Design Conditions

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented on the BPDA Sea Level Rise - Flood Hazard Area (SLR-FHA) map, which depicts a modeled 1% annual chance coastal flood event with 40 inches of sea level rise (SLR). Use the online BPDA SLR-FHA Mapping Tool to identify the highest Sea Level Rise - Base Flood Elevation for the site. The Sea Level Rise - Design Flood Elevation is determined by adding either 24” of freeboard for critical facilities and infrastructure and any ground floor residential units OR 12” of freeboard for other buildings and uses.

Sea Level Rise - Base Flood Elevation:	*Ft BCB*		
Sea Level Rise - Design Flood Elevation:	*Ft BCB*	First Floor Elevation:	*Ft BCB*
Site Elevations at Building:	*Ft BCB*	Accessible Route Elevation:	*Ft BCB*

Describe site design strategies for adapting to sea level rise including building access during flood events, elevated site areas, hard and soft barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe how the proposed Building Design Flood Elevation will be achieved including dry / wet flood proofing, critical systems protection, utility service protection, temporary flood barriers, waste and drain water back flow prevention, etc.:

Describe how occupants might shelter in place during a flooding event including any emergency power, water, and waste water provisions and the expected availability of any such measures:

Describe any strategies that would support rapid recovery after a weather event:

E.2 – Sea Level Rise and Storms – Adaptation Strategies

Describe future site design and or infrastructure adaptation strategies for responding to sea level rise including future elevating of site areas and access routes, barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation and further protecting critical systems, including permanent and temporary measures:

A pdf and word version of the Climate Resiliency Checklist is provided for informational use and off-line preparation of a project submission. NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

For questions or comments about this checklist or Climate Change best practices, please contact: John.Dalzell@boston.gov

Appendix D: Transportation Supporting Documentation

Note: Materials are provided on the enclosed CD-ROM. Hard copies are available upon request.

Traffic Counts

Synchro Reports

- **Existing Conditions**
- **No-Build Conditions**
- **Build Conditions**

Appendix E: Energy and Greenhouse Gas Supporting Documentation

Note: Materials are provided on the enclosed CD-ROM. Hard copies are available upon request.

Appendix F: Metes & Bounds

Note: Materials are provided on the enclosed CD-ROM. Hard copies are available upon request.

Appendix G: Historic Resources Supporting Documentation

Historic Resources in the Project Vicinity

A survey was undertaken to identify historic resources within and in the vicinity of the Project Site. Table G-1 lists State and National Registered-listed properties and historic districted located within a quarter mile radius of the Project Site. Refer to Figure 5.6 for the location of these resources.

Table G-1 Historic Resources in the Vicinity of the Project Site

No.	Resource Name	Location	MHC Inventory No.	Designation
Properties listed in the State and National Registers of Historic Places				
A	Back Bay Fens	Multiple	BOS.JD	NR, LL
B	Fenway Park	24 Yawkey Way	BOS.ZT	NR
C	Bay State Road- Back Bay West Architectural	Multiple	BOS.JC	LHD
D	Olmsted Park System	Multiple	BOS.IO	NR
Properties included in the Inventory of Historic and Archaeological Assets of the Commonwealth				
1	M.E. Wyzanski Building	76-88 Brookline Avenue	BOS.7502	INV
2	Park Riding School	145-151 Ipswich Street	BOS.7501	INV
3	Church of the Disciples (Boston Temple Seventh-day Adventist Church)	105 Jersey Street	BOS.7578	INV
4	R.H. Booth Sales Company/U.S. Post Office – Kenmore Station Branch	45 Lansdowne Street	BOS.7503	INV
5	Standard Rim and Wheel Company Building (Boston University – Art Institute of Boston)	601 Newbury Street	BOS.15385	INV

No.	Resource Name	Location	MHC Inventory No.	Designation
6	Fen Drive Apartment Building	61 Park Drive	BOS.7552	INV
7	Nashdome Apartment Building	65 Park Drive	BOS.7553	INV
8	Park Drive Apartment Building	69 Park Drive	BOS.7554	INV
9	Theodore M. Clark Town House	107 Park Drive	BOS.7555	INV
10	Apartment Building	111 Park Drive	BOS.7556	INV
11	Rotenberg and Rudnick Apartments	125, 131, 137, 143, 149, 151 Park Drive	BOS.7557, 7558, 7559, 7560, 7561, 7562	INV
12	H.C. Birburie Town Houses	22, 24, 26, 28, 30, 32 Peterborough Street	BOS.7570, 7571, 7572, 7573, 7574	INV
13	Sumner Apartment Building	35-45 Peterborough Street	BOS.7575	INV
14	Stuart Apartment Building	36-46 Peterborough Street	BOS.7576	INV
15	Martin Milmore Public School	85 Peterborough Street	BOS.7577	INV
16	Robert Treat Paine Jr. Town House	1 Queensberry Street	BOS.7585	INV
17	The Grocery Store Pantry	37 Queensberry Street	BOS.7586	INV

NR National Register of Historic Places
LL Boston Local Landmark (State Register of Historic Places)
LHD Local Historic District
INV Listed in the Inventory of Historic and Archaeological Assets of the Commonwealth, no current designation

Properties Listed in the State and National Registers of Historic Places

Back Bay Fens (BOS.JD)

The Back Bay Fens were designed by notable landscape architect Frederick Law Olmsted (1822–1903) beginning in the late nineteenth century. The parkland serves as a link in the linear Emerald Necklace park system. Construction of the park was part of the major engineering and building effort to fill in the Back Bay. The result was the transformation of a polluted marsh into a recreation area in a newly developing neighborhood of the city. There are gardens, footbridges, monuments, and memorials throughout the park.

Fenway Park (BOS.ZT)

Fenway Park is an athletic field in the Fenway neighborhood of Boston. It is the country's oldest operating ballpark in Major League Baseball. Along with Chicago's Wrigley Field, Fenway is one of two remaining examples of an early-twentieth century ballpark. Fenway was designed in 1912 by architect James E. McLaughlin with work completed by Osborn Engineering of Cleveland. Subsequent additions and renovations were designed and built by Charles Logue Building Company, Coleman Brothers, Arthur Bowditch, and Janet Marie Smith. The present building retains its original tapestry brick, two-story façade, and single-deck grandstand.

Bay State Road- Back Bay West Architectural (BOS.JC)

The Bay State Road- Back Bay West Architectural district was designated a Local Historic District in 1979. The irregularly-shaped district extends on the south side of Storrow Drive and includes buildings on either side of Bay State Road, as well as some buildings that front onto Beacon Street and Commonwealth Avenue. Examples of buildings within the district include the Arthur Little House (1890), the M.I.T. Student House (1900), and the Hotel Kenmore (1926), all designed in the Colonial Revival style. The district has significance in the Areas of Architecture, Commerce, Community Planning, Education, Health and Medicine, and Social History.

Olmsted Park System (BOS.IO)

The Olmsted Park System was designed by Frederick Law Olmsted beginning in the late nineteenth century and is a series of parks linked by parkways extending from the Muddy River to Franklin Park in Boston and Brookline. The park system includes the Back Bay Fens, monuments, pedestrian paths, and landscaping.

Properties included in the Inventory of Historic and Archaeological Assets of the Commonwealth

M.E. and C.E. Wyzanski Building, 76-88 Brookline Avenue (BOS.7502)

The M.E. and C.E. Wyzanski Building is a Classical Revival-style commercial building in the Fenway neighborhood. It was designed in 1916 by the architecture firm Monks and Johnson and builder William Crane. The two-story, flat-roof building features terra cotta facing dominated by monumental Doric pilasters and columns and medallions with a swag motif below the low parapet.

Park Riding School (BOS.7501)

The Park Riding School is a Victorian Eclectic-style, three-story, masonry building that was designed by the architecture firm, Wheelwright and Haven, in 1900. The building features arched openings and is a restrained example of the Queen Anne architectural style. It is one of the oldest buildings in this area of the West Fens.

Church of the Disciples (Boston Temple Seventh-day Adventist Church), 107 Jersey Street (BOS.7578)

The Church of the Disciples was designed in 1904 by architect James Purdon. The building is two stories in height with a one-story tower centered above the façade. The building exhibits characteristics of the Classical Revival and Colonial Revival architectural styles. The red brick walls are trimmed with white cast stone and marble with a monumental Ionic columned portico and a modillioned block cornice below a low parapet.

R.H. Booth Sales Company/U.S. Post Office – Kenmore Station Branch (BOS.7503)

The R.H. Booth Sales Company building was designed in 1924 in the Colonial Revival style by prominent Boston-based architectural firm Funk & Wilcox. The three-story building was executed in brick with cast-stone trim and features Georgian and Renaissance Revival-style ornamentation on the façade. The original owners manufactured billiard tables, bowling alleys and supplies, and refrigeration machinery.

Standard Rim and Wheel Company Building/Boston University -Art Institute of Boston (BOS.15385)

The Standard Rim and Wheel Company Building was designed by architectural firm Somes & Parsons and builder Wilson & Tomlinson in 1915 in the Craftsman style. The three-story, concrete and brick commercial building has large storefront openings along the façade. It was originally constructed for owner Charles Paine, who desired to use the building as an automobile showroom.

Fen Drive Apartment Building, 61 Park Drive (BOS.7552)

Architect George Nelson Jacobs, with builder Barney Glazer, designed this Classical Revival-style apartment building in the Fenway neighborhood in 1920. The five-story building is faced with pale yellow brick and cast stone trim and is capped with a flat roof. The architect designed many multi-family buildings in Boston between 1910–1930, specifically in the Back Bay and Fenway neighborhoods.

Nashdome Apartment Building, 65 Park Drive (BOS.7553)

The Nashdome Apartment Building was constructed in the Classical Revival style in 1920 by architect George Nelson Jacobs with builder Barney Glazer. The building faces southeast onto Park Drive and the Bay Back Fens. The four-story building is faced with pale yellow brick and cast stone trim and is capped with a flat roof. The main entrance is set underneath a segmental arch portico with shield and swag motifs and supported by fluted Corinthian columns and pilasters.

Park Drive Apartment Building, 69 Park Drive (BOS.7554)

The Park Drive Apartment Building is a four-story, pale yellow brick building that faces the Back Bay Fens. The building was designed by architect George Nelson Jacobs with builder Barney Glazer in the Classical Revival style. Characteristics of the Classical Revival style are evident in the modillioned cornice and dominating entrance portico with segmental arch entablature and Corinthian columns.

Theodore M. Clark Town House, 107 Park Drive (BOS.7555)

This four-story-over-basement red brick apartment building exhibits characteristics of the Queen Anne and Georgian Revival architectural styles and is dominated by its Mansard roof and rounded full-height bay windows. It was designed in 1902 by architect Theodore M. Clark.

Apartment Building, 111 Park Drive (BOS.7556)

The architectural firm Silverman, Brown and Hienan designed this Classical Revival-style apartment building in 1922. The H-shaped, five-story-over-basement building has yellow brick walls with cast-stone trim and an entrance portico featuring Corinthian columns with a swag-decorated entablature.

Rotenberg and Rudnick Apartments (BOS.7557, 7558, 7559, 7560, 7561, 7562)

This row of six red-brick apartment buildings on the east side of Kilmarnock Street was designed in 1922 in the Classical Revival style by architectural firm Silverman, Brown, & Hienan. The buildings have white cast-stone trim and octagonal bays and are separated from the street by a row of hedges. The architectural firm was responsible for a number of early-twentieth-century apartment houses in the Back Bay, Fenway, and Allston-Brighton neighborhoods.

H.C. Birburie Town Houses, 22, 24, 26,28, 30, 32 Park Drive (BOS.7570, 7571, 7572, 7338, 7573, 7574)

This row of six, three-story Georgian Revival-style townhouses was constructed in 1903 by architect Alfred L. Darrow with builder Boston Construction Company. The buildings have tan brick walls with white limestone trim, two-story bowfronts, and an enclosed flat roof with a galvanized iron denticulated and modillioned block cornice. These are among the oldest buildings in the West Fens. By 1917, Simmons Female College owned the rowhouses.

Sumner Apartment Building, 35-45 Peterborough Street (BOS.7575)

Architect George Nelson Jacobs, with builder Coleman and Gilbert, designed this four-story-over-basement Colonial Revival-style apartment building in 1915 for owner Mark Abrams. The U-shaped building surrounds a landscaped courtyard. The building has red brick walls with white terra cotta trim and a columned entrance.

Stuart Apartment Building, 36-46 Peterborough Street (BOS.7576)

The building was designed by architect George Nelson Jacobs and Coleman and Gilbert in 1915. The four-story-over basement Colonial Revival-style building has red brick walls trimmed with cast stone and an elaborate entrance with unpedimented entablature supported by columns.

Martin Milmore Public School, 85 Peterborough Street (BOS.7577)

The Martin Milmore School was designed in 1929 by architect George E. Robinson. The two-story-over-basement building was constructed in an L-shaped plan with planar masonry walls with cast-stone trim. It evidences characteristics of the Georgian Revival architectural style with its Tuscan columned main entrance, large quoins, and pedimented entablature with gable end returns. The school was constructed to serve the surrounding neighborhood that quickly developed in the early-to-mid-twentieth century.

Robert Treat Paine Jr. Town House, 1 Queensberry Street (BOS.7585)

This Georgian Revival-style mansion was constructed in 1899–1901 by architect Charles K. Cummings for owner Robert Treat Paine Jr., an attorney. The building was originally three stories in height over a basement; the fourth story is a later addition. The walls are of red pressed brick with brownstone trim. A wide, full-height bowed bay is at the corner near Queensbury Street. This is the oldest building in the West Fens neighborhood.

The Grocery Store Pantry, 367 Queensberry Street (BOS.7586)

Architect Nathan Douglas designed this narrow building in 1919. The rectangular-shaped, two-story building has red brick walls and a terra cotta cornice. The building was originally constructed to house a laundry and grocery store to support the surrounding residential neighborhood.

Appendix H: Environmental Supporting Documentation

DRAFT REPORT

1252-1270 BOYLSTON

BOSTON, MA

PEDESTRIAN WIND STUDY
RWDI # 1804592
March 19, 2019

SUBMITTED TO

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EXECUTIVE SUMMARY

A Pedestrian Wind Study was conducted for the proposed 1252-1270 Boylston project in Boston, MA. Two site configurations, No Build and Build, were tested and analyzed in accordance with the pedestrian wind criteria adopted by the Boston Planning and Development Agency (BPDA). The results are graphically depicted on a site plan in **Figures 1a through 2b**. These conditions and the associated wind speeds are also numerically represented in **Tables 1 and 2**. The results presented can be summarized as follows:

Effective Gust

- For the No Build configuration, most grade level locations are expected to meet the effective gust criterion with the exception of two locations west of the existing building.
- With the addition of the proposed 1252-1270 Boylston development, all locations are anticipated to meet the effective gust criterion.

Mean Speed

- The mean wind speeds for the No Build configuration are generally expected to be comfortable for walking or more passive activities throughout the year, with the exception of uncomfortable conditions in the area west of the existing building.
- Mean speed conditions are expected to remain similar with the addition of the 1252-1270 Boylston development, however, increased wind activity is predicted east of the proposed development, particularly at the intersection of Boylston St. and Park Dr.
- No perceptible change to mean wind speeds is expected within Black Bay Fens or Fenway Park.

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1 INTRODUCTION

RWDI was retained by Scape USA Acquisitions, LLC to conduct a Pedestrian Wind assessment for the proposed 1252-1270 Boylston ("Project") in Boston, MA. This report presents the Project objectives, background, approach, provides a discussion of the results from RWDI's assessment. The criteria recommended by the Boston Planning and Development Agency (BPDA) were used in this study.

1.1 Project Description

The Project (site shown in **Image 1**) is located east of Jersey St. between Boylston St. and Peterborough St. The proposed building is approximately 200 ft. in height, consisting of 15-stories and includes an outdoor terrace and pedestrian sitting area on Level 2.

1.2 Objectives

The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas around the study site and provide recommendations for minimizing adverse effects. The study involved wind simulations on a 1:300 scale model of the proposed building and surroundings. These simulations were conducted in RWDI's boundary-layer wind tunnel at Guelph, Ontario, to quantify local wind speed conditions and compare to appropriate criteria for gauging wind comfort in pedestrian areas. The assessment focused on critical pedestrian areas including the main entrances, outdoor amenity spaces, adjacent properties, and sidewalks along nearby streets.

Image 1: Site Plan – Aerial View of the Existing Site and Surroundings (Courtesy of Google™ Earth)

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

To assess the wind environment around the proposed Project, a 1:300 scale model of the Project site and surroundings was constructed for the wind tunnel testing of the following configurations:

A – No Build: Existing site with existing surroundings (**Image 2a**), and;

B – Build: Proposed Project and winter landscaping with existing surroundings, including 1241 Boylston St that is under review with the BPDA (**Image 2b**).

The scale model of the proposed Project (as shown in **Image 2b**) was constructed using the design information and drawings listed in ***Appendix A***. The wind tunnel model included all relevant surrounding buildings and topography within an approximately 1200 ft. radius of the study site. The mean speed profile and turbulence of the natural wind approaching the modelled area were also simulated in RWDI's boundary layer wind tunnel. The scale model was equipped with 122 specially designed wind speed sensors. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site, and reviewed by SCAPE USA Acquisitions, LLC. The wind speed sensors were connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full-scale height of 5 feet above pedestrian areas throughout the study site. Wind speeds were measured for 36 wind directions, in 10 degree increments, starting from true north. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the reference wind speed in the free stream above the model.

Image 2a: Wind Tunnel Study Model – No Build Configuration

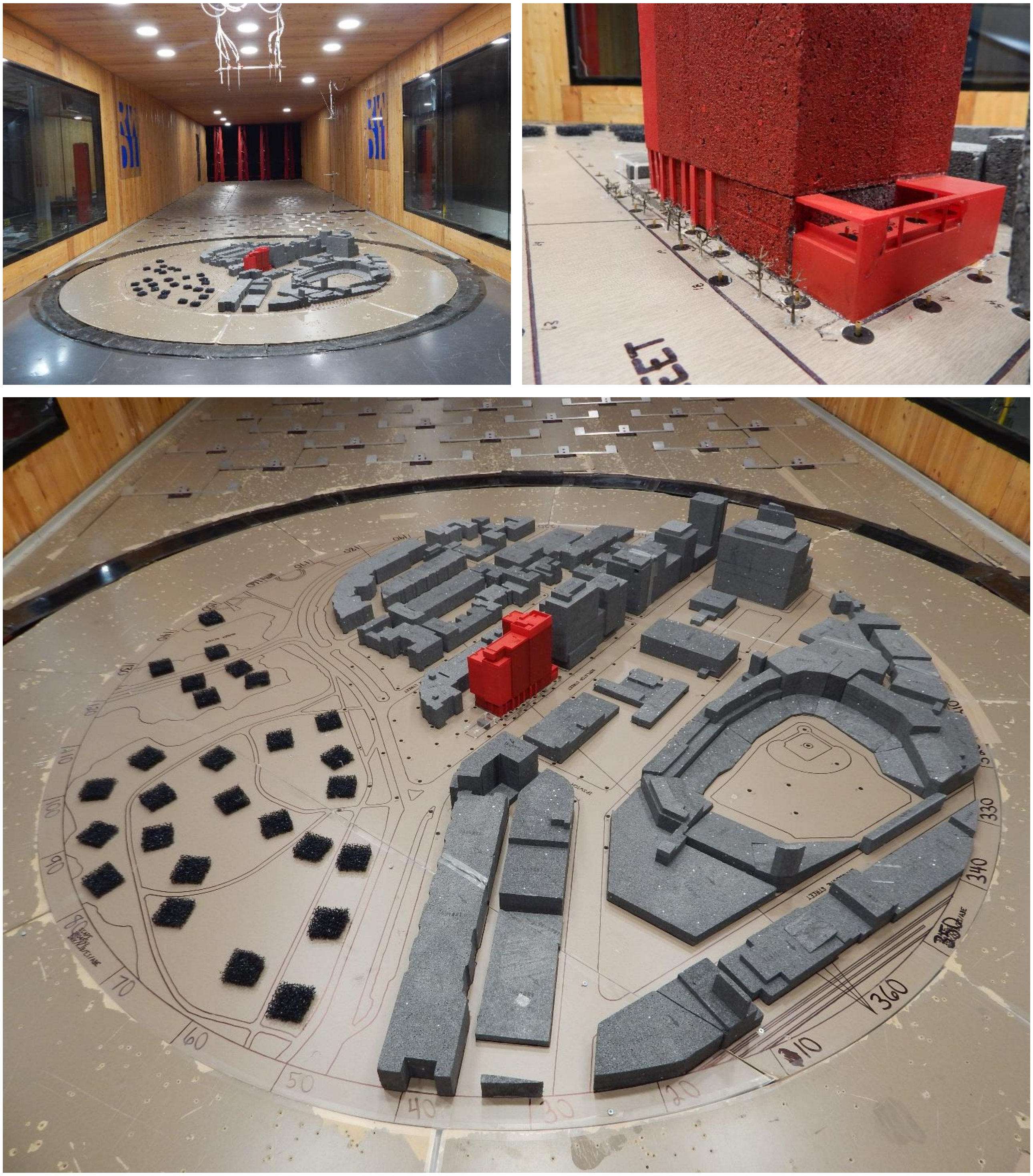
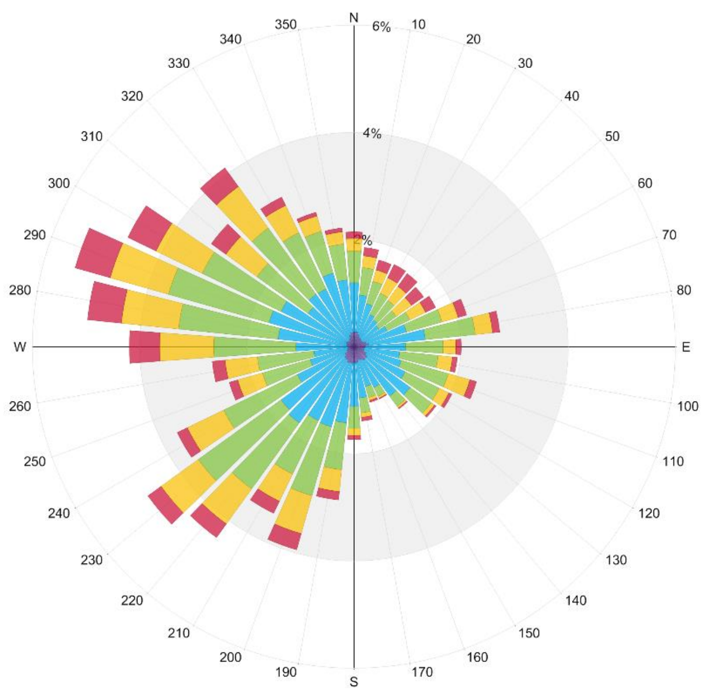


Image 2b: Wind Tunnel Study Model – Build Configuration

2.2 Meteorological Data

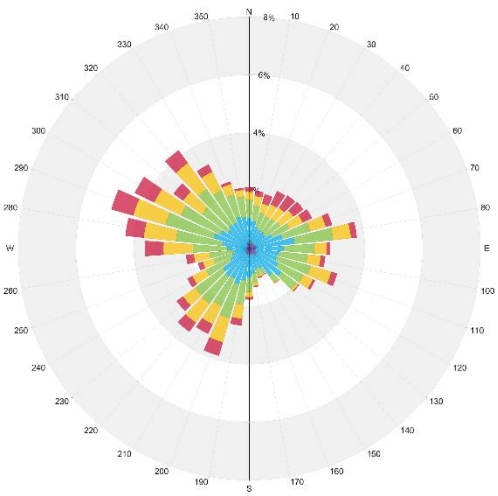
The results were then combined with long-term meteorological data, recorded during the years 1995 through 2018 at Boston's Logan International Airport to predict full scale wind conditions. The analysis was performed separately for each of the four seasons and for the entire year. **Images 3 and 4** present "wind roses", summarizing the annual and seasonal wind climates in the Boston area respectively, based on the data from Logan Airport.

For example, the wind rose in **Image 3**, summarizes the annual wind data which in general, indicates the most common wind directions are those between north-northwest and south-southwest. Winds from the east-northeast to the east-southeast are also relatively common. In the case of strong winds, west-northwest, northwest and west are the dominant wind directions.

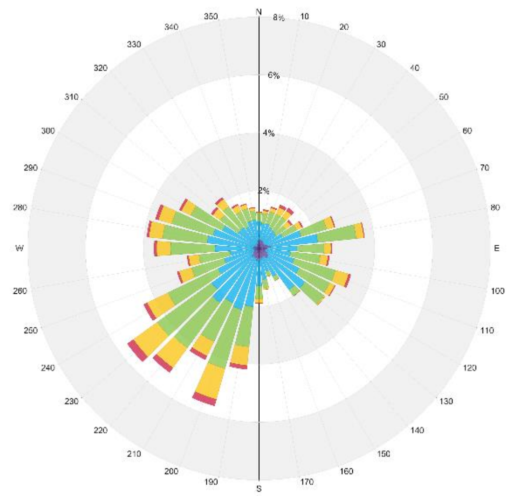


Wind Speed (mph)	Annual Probability (%)
Calm	3.0
1-5	7.9
6-10	32.5
11-15	32.4
16-20	16.3
>20	7.9

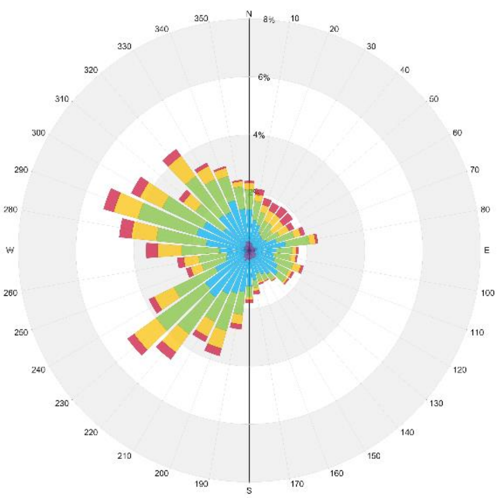
Image 3: Annual Directional Distribution of Winds Approaching Boston Logan International Airport from 1995 to 2018



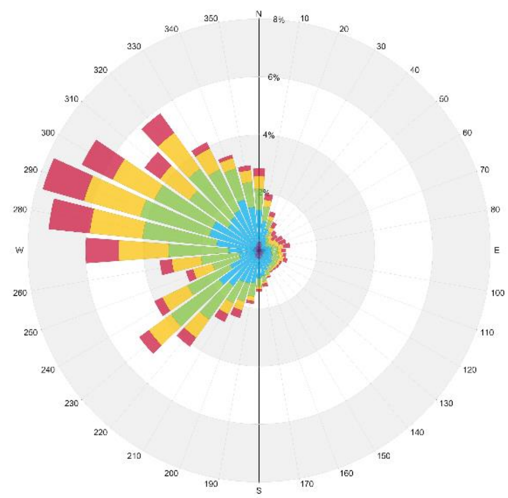
Spring (March – May)



Summer (June – August)



Fall (September – November)



Winter (December – February)

Wind Speed (mph)	Seasonal Probability (%) Spring	Summer	Fall	Winter
Calm	2.8	3.0	3.4	2.6
1-5	6.8	9.4	8.7	6.5
6-10	28.9	38.8	34.6	27.9
11-15	32.3	34.4	32.0	30.9
16-20	19.2	11.8	14.5	19.7
>20	10.1	2.6	6.8	12.4

Image 4: Seasonal Directional Distribution of Winds Approaching Boston Logan International Airport from 1995 to 2018

2.3 Wind Criteria

The BPDA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BPDA 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 mph should not be exceeded more than one percent of the time. The second set of criteria used by the BPDA to determine the acceptability of specific locations 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 1% of the time (i.e., the 99-percentile mean wind speed). They are as follows:

BPDA Mean Wind Criteria*

Comfort Category	Mean Wind Speed (mph)
Dangerous	> 27
Uncomfortable for Walking	> 19 and ≤ 27
Comfortable for Walking	> 15 and ≤ 19
Comfortable for Standing	> 12 and ≤ 15
Comfortable for Sitting	< 12

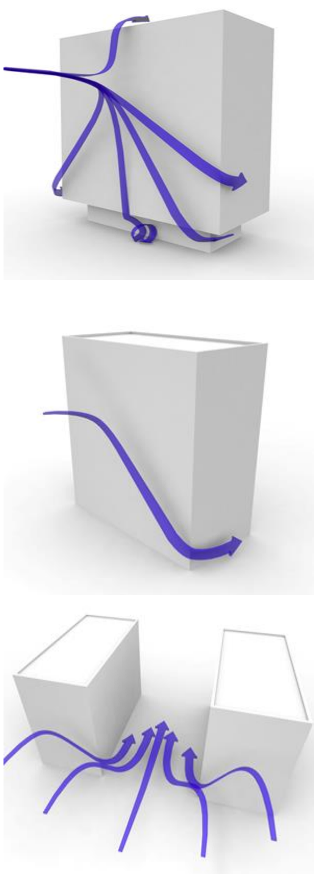
* Applicable to the hourly mean wind speed exceeded 1% of the time.

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

The wind climate found in a typical downtown location in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BPDA effective gust velocity criterion of 31 mph. However, without any mitigation measures, this wind climate is likely to be frequently uncomfortable for more passive activities such as sitting.

2.4 General Wind Flow Patterns

In our discussion of anticipated wind conditions, reference may be made to the following generalized wind flows shown in **Image 5**.



Downwashing
Tall buildings tend to intercept the stronger winds at higher elevations and redirect them to the ground level. This is often the main cause for wind accelerations around large buildings at the pedestrian level.

Corner Acceleration
When winds approach at an oblique angle to a tall façade and are deflected down, a localized increase in the wind activity or corner acceleration can be expected around the exposed building corner at pedestrian level.

Channeling Effect
When two buildings are situated side by side, wind flow tends to accelerate through the space between the buildings due to the narrow gap.

Image 5: Generalized wind flows

3 RESULTS AND DISCUSSION

The predicted wind comfort and safety conditions pertaining to the two configurations assessed are graphically depicted on a site plan in **Figures 1a through 2b** located in the "***Figures***" section of this report. These conditions and the associated wind speeds are also presented in **Tables 1 and 2**, located in the "***Tables***" section of this report. Typically, the summer and fall winds tend to be more comfortable than the annual winds while the winter and spring winds are less comfortable than the annual winds. The following summary of pedestrian wind comfort is based on the annual winds for each configuration, except where noted in the text. Furthermore, wind speed sensors 89 to 103 are not shown in the supporting figures, as these sensors were located on the study building itself.

Wind conditions comfortable for walking are appropriate for sidewalks and walkways as pedestrians will be active and less likely to remain in one area for prolonged periods of time. Lower wind speeds conducive to standing are preferred at main entrances where pedestrians are apt to linger. **Wind conditions that meet the effective gust criterion are predicted for the Build configuration assessed**. The following is a detailed discussion of the predicted mean speed and effective gust conditions for the No Build and Build configurations.

3.1.1 No Build Configuration

Mean Speed

The mean wind speeds around the No Build configuration are generally expected to be comfortable for walking or more passive activities throughout the year (**Figure 1a**). These conditions are considered appropriate for the intended pedestrian use of the areas. Uncomfortable mean wind speeds are predicted in the alley west of the existing building (Locations 15 through 17, 33, and 34 in **Figure 1a**). These conditions stem from winds accelerating around the northeast corner of the neighboring building, being channeled in the alley, and downwashing off the west façade of the existing building.

Effective Gust

Wind speeds at most locations for the No Build configuration are predicted to meet the effective gust criterion on an annual basis (**Figure 2a**). An exception is two locations in the alley west of the existing building, where wind speeds are predicted to marginally exceed the effective gust criterion (Locations 15 and 16 in **Figure 2a**).

3.1.2 Build Configuration

Mean Speed

Main entrances of the proposed building are situated near Locations 1, 3, 4, and 6 in **Figure 1b**. Mean speeds at these entrances are expected to be comfortable for sitting which is suitable for the intended pedestrian use (**Figure 1b**).

On an annual basis, wind comfort conditions around the site are expected to remain similar with the addition of the 1252-1270 Boylston development compared to the No Build configuration. Mean wind speeds at most areas are typically expected to be comfortable for walking or more passive activities and uncomfortable mean speeds are expected to remain in the alley (Locations 15, 16, and 34 in **Figure 1b**). However, due to downwashing off the north façade of the proposed building, increased wind activity is predicted east of the proposed development, particularly in front of the existing gas station (Locations 56 and 57 in **Figure 1b**) and at the intersection of Boylston St. and Park Dr. No dangerous wind conditions are predicted in the Build configuration (**Figure 1b**) and no perceptible change to mean wind speeds is expected within Black Bay Fens or Fenway Park.

Effective Gust

With the addition of the proposed Project, wind speeds are predicted to meet the effective gust criterion at all locations tested (**Figure 2b**).

4 APPLICABILITY

The wind conditions presented in this report pertain to the proposed 1252-1270 Boylston as detailed in the architectural design drawings listed in Appendix A. Should there be any design changes that deviate from this list of drawings, the wind condition predictions presented may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

REPORT

1252-1270 BOYLSTON

DETAILED SOLAR REFLECTION ANALYSIS

JANUARY 14, 2019
PROJECT #1804592

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to investigate the impact that solar reflections emanating from the proposed SCAPE development will have on the surrounding urban realm.

Thermal Impacts on People

The planar nature of the facades of the proposed development ensure that reflected sunlight will not focus (multiply) in any particular area. Therefore, RWDI does not expect any significant thermal impacts (i.e. risks to human safety or property damage) to occur either on the site or in the surrounding neighborhood.

Visual Glare Impact on Drivers

As with the addition of any glazed building, drivers travelling in the vicinity of the building are expected to experience an increased level of visual glare impact. Drivers along Boylston Street and Ipswich Street are predicted to experience reflections from the buildings which can cause a high level of impact. Some of these impacts occur at times where the sun would also be within the driver's field-of-view, which would likely act to reduce the perceived impact on drivers.

In addition, the majority of these impacts are infrequent and short in duration, and they overall occur at less than 1% of the daytime annually.

Visual Glare Impact on Pedestrians and Facades

Typical levels of visual glare are possible for pedestrians and building occupants in the vicinity of the development. These types of reflections represent at worst a visual nuisance, as viewers can safely look away or close blinds. These impacts have the potential occur in a small fraction of the year.

Thermal Impact on Facades

At all studied facade areas, reflections are of low intensity. Hence, we would not expect these reflections to lead to a significant additional cooling load for a building. Should an individual choose to expose themselves to the reflected energy, they may feel warm, however this would be a temporary experience and one which would be remedied by closing window treatments.

Overall Impact of Reflections

The impacts of this development on its surrounds are typical of any modern building of this size. If mitigation is desired, we have provided strategies to minimize the reflection impacts. For further details, refer to the Mitigation Suggestions section on page 23.

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INTRODUCTION

This report provides the computer modeling results of reflected sunlight from the proposed SCAPE building in Boston, MA. The proposed residential building is located at the intersection of Boylston Street and Ipswich Street (as shown in Figure 1). It is our understanding that the development will be surrounded by typical urban spaces such as busy roadways, and other buildings.

RWDI was retained to investigate the impact that solar reflections emanating from the proposed development will have on the surrounding urban terrain.

A preliminary set of simulations was conducted to determine peak reflection intensities and the frequency of reflection occurrence for a broad area around the development. This served to identify areas which may experience high intensity or very frequent reflections. This information informed the selection of 24 points for a more detailed analysis.

These receptor points represent drivers, pedestrians, and building facades and the detailed results allow us to quantify the frequency, intensity and duration of glare events at the receptors as well as the sources of those reflections.

Figure 1: Location of the SCAPE Building (Orange Box) (Map Credit: Google Earth)

Urban Reflections

While a common occurrence, solar reflections from buildings can lead to numerous visual and thermal issues.

Visual glare can:

- Impair the vision of motorists and others who cannot easily look away from the source;
- Cause nuisance to pedestrians or occupants of nearby buildings; and,
- Create undesirable patterns of light throughout the urban fabric.

Heat gain can:

- Affect human thermal comfort;
- Be a safety concern for people and materials, particularly if multiple reflections are focused in the same area; and
- Create increased cooling needs in conditioned spaces affected by the reflections.

The most significant safety concerns with solar reflections occur with concave facades (Figure 2) which act to focus the reflected light in a single area. RWDI does not expect this to be a concern given the form of the project.

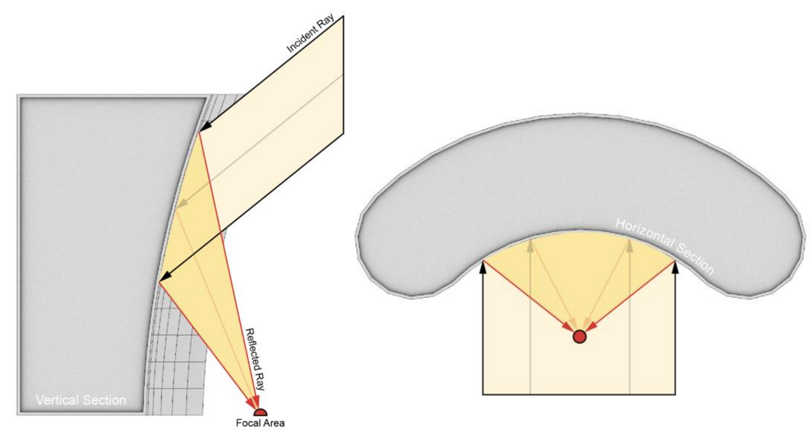


Figure 2: Illustration of Reflection Focusing Due to a Concave Facade

Methodology

RWDI assessed the potential reflection issues using RWDI's in-house proprietary *Eclipse* software, in two phases as per the steps outlined below:

- The Phase 1 'Screening' assessment began with the development of a 3D model of the area of interest (as shown in Figure 3). This was then subdivided into many smaller triangular patches (see Figure 4).
- For each hour in a year, the expected solar position was determined, and "virtual rays" were drawn from the sun to each triangular patch of the 3D model. Each ray that was considered to be "unobstructed" was reflected from the building surface and tracked through the surrounding area. The study domain included the entire pedestrian realm within 1,200 feet of the proposed building.
- The total reflected energy at that hour from all of the patches was computed and its potential for visual and thermal impacts was assessed.
- Finally, a statistical analysis was performed to assess the frequency, and intensity of the glare events occurring throughout the year within the nearby airspace. The criteria used to assess the level of impact can be found in Appendix B of this report.

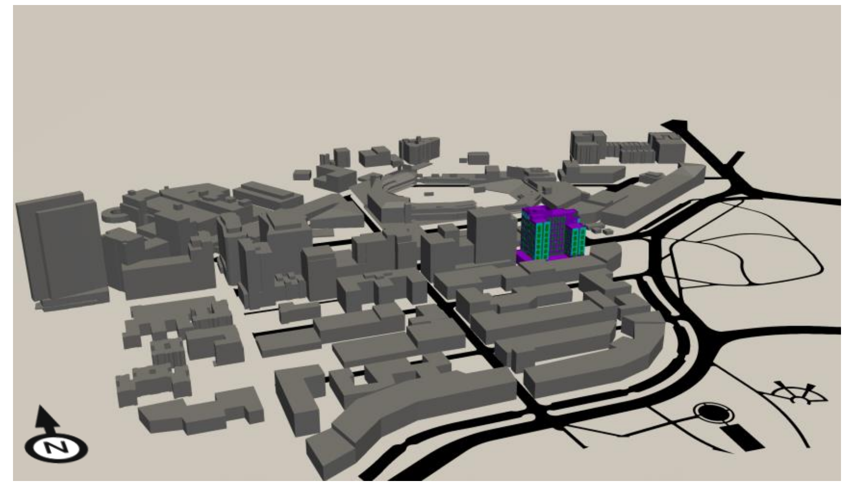


Figure 3: 3D Computer Model of the Proposed Development and Surrounding Context

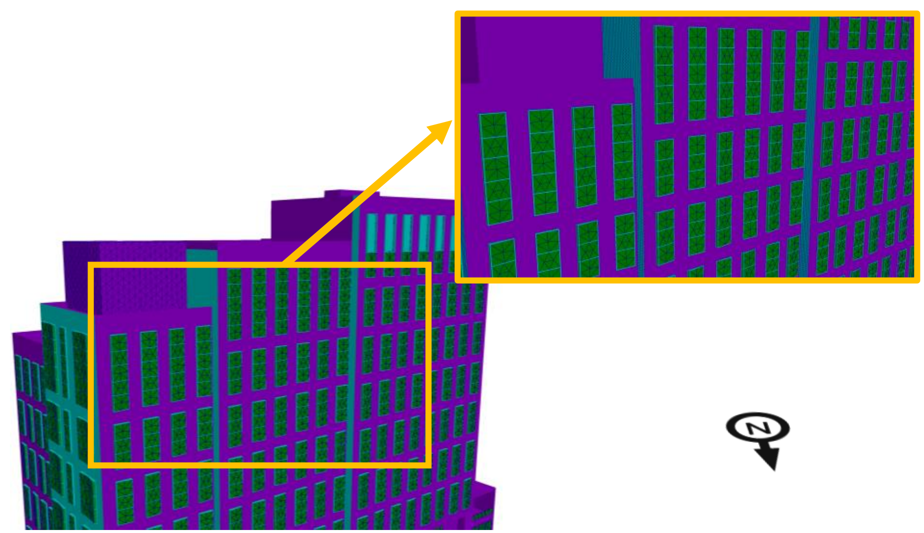


Figure 4: Close-up View of the Model, Showing Surface Subdivisions

BACKGROUND AND APPROACH

Methodology (cont'd)

- Based on the findings of the Screening analysis, representative 'receptor points' were selected to undergo the Phase 2 'Detailed' analysis.

- The points were chosen to understand in greater detail how reflections from the building will impact drivers, pedestrians and the rest of the built environment. The selected locations of the points are discussed further in the Detailed Analysis section this report.

- The Detailed analysis process is similar to the Screening analysis, except reflections are analyzed at one minute increments for the entire year.

- In addition to the frequency and duration of reflection impacts, the Detailed analysis allows for the prediction of when impacts can occur, how long they can occur for and which building element is the source.

Assumptions and Limitations

Meteorological Data

This analysis used 'clear sky' solar data computed at the location of Logan International Airport. This approach uses mathematical algorithms to derive solar intensity values for a given location, ignoring local effects such as cloud cover. This provides a 'worst case' scenario showing the full extent of when and where glare could ever occur.

Radiation Model

RWDI's analysis is only applicable to the thermal and visual impacts of solar radiation (i.e. ultraviolet, visible and infrared wavelengths) on people and property in the vicinity of the development. It does not consider the impact of the building related to any other forms of radiation, such as cellular telephone signals, RADAR arrays, etc.

Study Building and Surrounds Models

The analysis was conducted based on a 3D model of the proposed development provided by Gensler to RWDI on November 30, 2018.

The surroundings model was developed based on data made available by the City of Boston. The surrounds model includes all buildings which currently exist or are approved for construction by the BPDA.

The ground surface and the surrounding buildings were topographically corrected based on a high-resolution LiDAR survey conducted by the National Oceanic and Atmospheric Administration (NOAA) in 2013-2014. NOAA states that the horizontal accuracy of this data set is 16.5 inches at a 95% confidence level. Its vertical accuracy is stated as 4.8 inches at a 95% confidence level.

Potential reductions of solar reflections due to the presence of Vegetation or other non-architectural obstructions were not included, nor are reflections from other buildings. Light that has reflected off several surfaces is assumed to have a negligible impact. As such, only a single reflection from the development was included in the analysis.

Assumptions and Limitations (cont'd)

Facade Material Reflectance

The reflective properties of the glazing units located on the proposed building were determined based on information provided by Gensler on December 7, 2018. The exact glazing unit had not been decided upon at the time of the this study, instead RWDI was provided with several options which are under consideration by the design team. The reflectivity properties of all the options were similar, thus we have elected to treat all the glazing as Viracon VE1-2M glazing units.

Viracon VE1-2M on Ultraclear glass has a nominal visible reflectance of 11%, and a full spectrum reflectance (which relates to heat gain related issues) of 31%.

Metal panels were also noted in the 3D model. We have assumed the metal panels to have a matte finish, and therefore a conservative visible and full spectrum reflectance of 10% has been assumed.

The reflectance properties of the reflective elements are summarized in Table 1. Figure 5 illustrates the location of the reflective materials on the facades.

Applicability of Results

The results presented in this report are highly dependent on both the form and materiality of the facade. Should there be any changes to the design, it is recommended that RWDI be contacted and requested to review their potential effects on the findings of this report.

This report has endeavored to provide a robust and suitably conservative analysis of the potential effects of reflected sunlight, contextualized based on current industry and academic research, and common best practices. Regulation and enforcement of performance requirements is the responsibility of the relevant regional regulatory authority.

Assumptions and Limitations (cont'd)

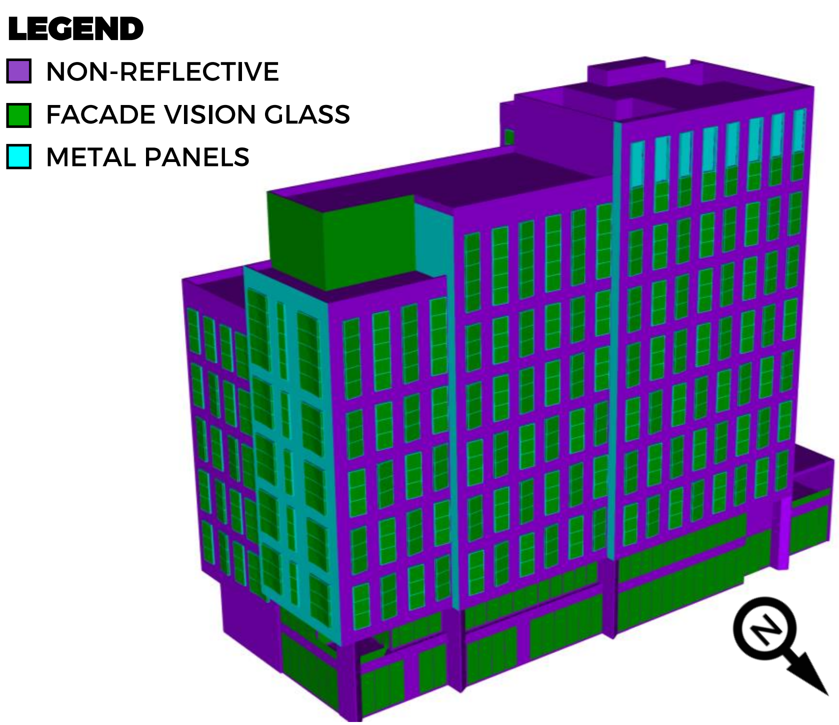


Figure 5: Locations of Reflective Building Elements (Surrounding Context Removed for Clarity)

Table 1: Nominal Visible and Full Spectrum Reflectance Values of the Reflective Building Elements

Location	Material	Visible Reflectance	Full Spectrum Reflectance
IGU	VE1-2M	11%	31%
Metal Panels	-	10%	10%

SCREENING ANALYSIS RESULTS

Presentation of Results

This section presents the screening results pertaining to the solar impacts of the development on the surrounding urban area. The following three plots are presented:

Peak Annual Reflected Irradiance
This plot displays the annual peak intensity of all reflections emanating from the development at a typical pedestrian height (5 feet) above local grade.

Two versions of this plot are included:

- **Visible Reflectance (Visual Glare):** This plot (Figure 6a) displays the intensity of reflected visible light only. Depending on the ambient conditions, reflection intensities as low as 50 W/m² could be visible to people outdoors.

- **Full Spectrum Reflectance (Heat Gain):** This plot (Figure 6b) presents the total intensity of a reflection, including both visible light and thermal energy which relates to the risk of excessive heat gain. For full spectrum reflectance, RWDI considers 1500 W/m² as a short term thermal comfort threshold and reflections above 2500 W/m² as a human safety threshold (refer to Appendix B).

Frequency of Significant Visual Reflections
This plot (Figure 6c) identifies the locations of the most frequent significant reflections emanating from the facades. In this context a 'significant' reflection is one that is at least 50% as intense as one that would cause after imaging on a viewer (refer to Appendix B).

As this criteria is visually based, the visible reflectance of the facades was used.

In order to attain a complete understanding of the impact that reflections may have on people, other factors must be considered, including the duration of the reflections and when they occur. The following plots serve to illustrate the general characteristics of reflections from the development and inform the locations of the receptor points used in the detailed phase of work which will analyze these factors in greater detail.

Peak Annual Reflected Irradiance - Visible Reflectance (Visual Glare)

Reflections as low as 50 W/m² may be visible to people, depending on outdoor lighting levels.

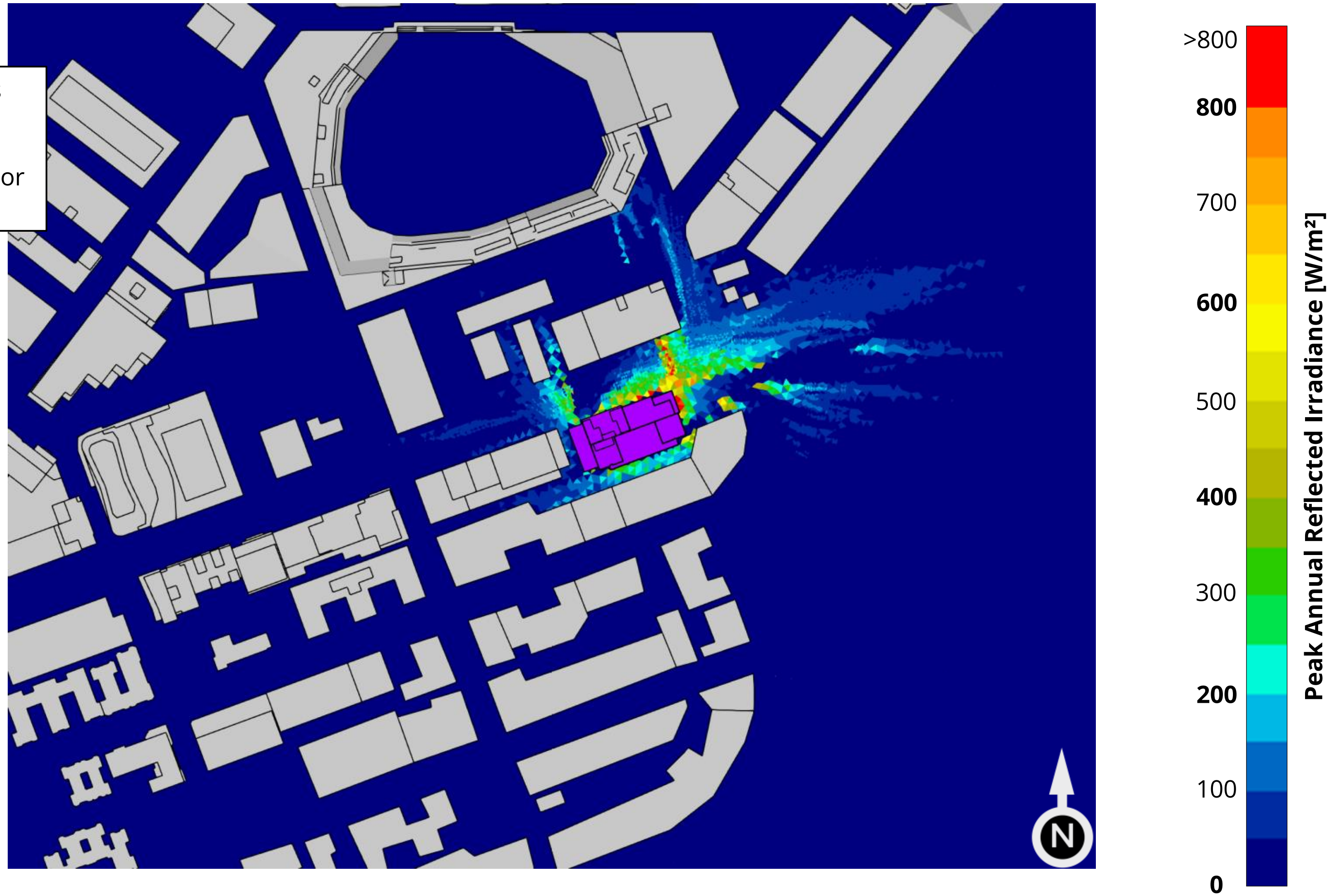


Figure 6a: Maximum Annual Intensity of Visible Reflections at Pedestrian Height

Peak Annual Reflected Irradiance - Full Spectrum Reflectance (Heat Gain)

800 W/m² represents a typical intensity for direct sunlight.

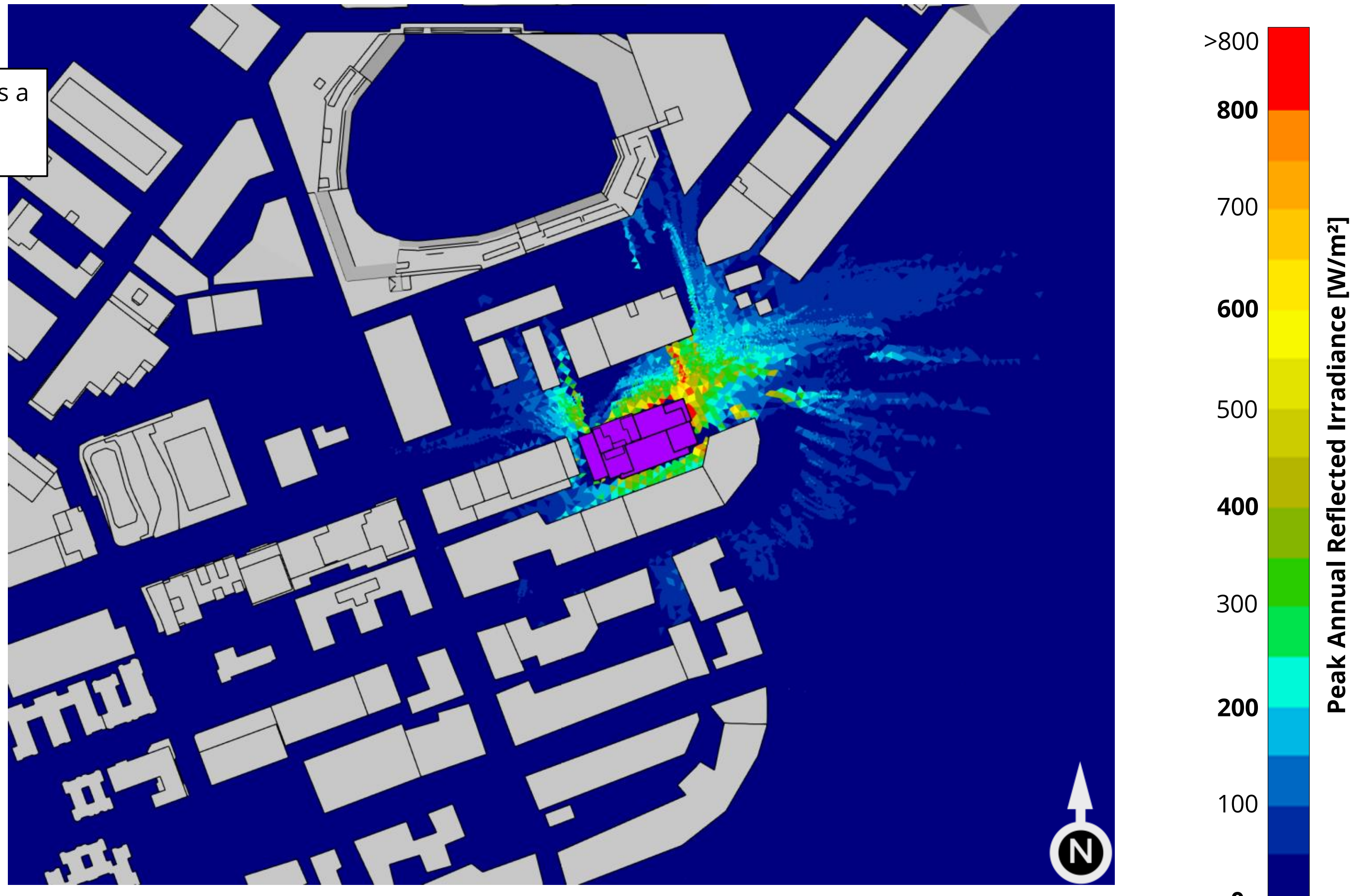


Figure 6b: Maximum Annual Intensity of Full Spectrum Reflections at Pedestrian Height

Frequency of Significant Visible Reflections

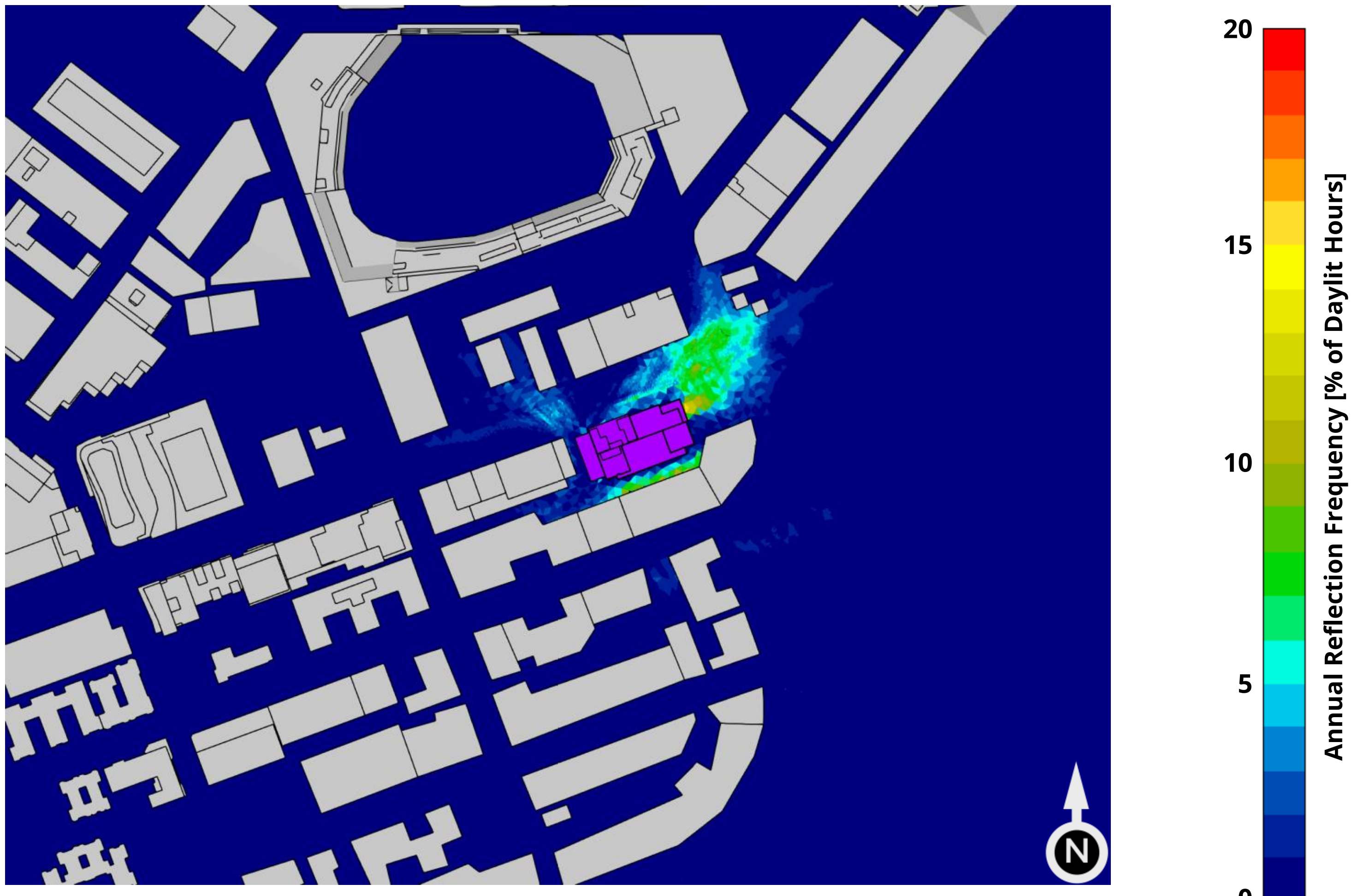


Figure 6c: Frequency (% of Daylit Hours) Where Significant Visible Reflections Can Occur

SCREENING ANALYSIS OBSERVATIONS

1. Like any contemporary building, the reflective surfaces of the proposed development are naturally causing solar reflections in the surrounding neighborhood.
2. The planar nature of the facades of the buildings prevent reflections from focusing (concentrating) in any particular area. Thus, RWDI does not anticipate any heat gain issues on people or property.
3. At pedestrian level, reflections are predicted to fall most frequently onto the area immediately northeast and south of the SCAPE building and to a lesser extent, immediately northwest building. The maximum frequency of glare occurrence found at pedestrian level is approximately 16% of daytime hours.
4. Reflections from the development are generally confined to the area within 350 feet of the buildings and may impact eastbound and westbound drivers on Boylston Street as well as southbound drivers on Ipswich St.
5. The occupants of the buildings located close to the development are expected to experience visible reflections from the development. That being said, they do not pose a risk to safety, and are likely a nuisance at worst, as the occupants can look away or close blinds.
6. Pedestrians on Boylston Street and Ipswich Street may also experience intermittent reflections. This condition is common in many urban centers and is unlikely to present a significant safety risk.
7. We do not anticipate reflections from this development to have an impact on the Massachusetts Turnpike, nor at Fenway Park.

DETAILED ANALYSIS RESULTS

Based on the findings of the Screening Analysis and the risk levels associated with reflections effecting specific areas, 24 representative points were selected for the Detailed Analysis. These points are described in Table 2 and illustrated in Figure 7.

Table 2: Receptor Descriptions

Receptor Number	Receptor Description
D1-D2	Westbound drivers on Boylston St. at Park Dr.
D3	Westbound drivers on Boylston St. at Ipswich St.
D4,D6	Southbound drivers on Ipswich St. at Boylston St., and at private alley
D5,D7	Eastbound drivers on Boylston St. at private alley, and along the street
D8	Westbound drivers on Boylston St. in front of the building
P9-P10	Pedestrians on south side of Boylston St.
P11-P14	Pedestrians on north side of Boylston St.
P15-P17	Fenway Park
F18-F20	Facades at approximately 2nd floor height of approximately 1249, 1255, and 1271 Boylston St.
F21-F23	Facades at approximately 3rd, 4th and 3rd floor height at the rear side of approximately 1-16 Peterborough St.
F24	Facade at approximately 3rd floor height on the southern side of Fenway Park

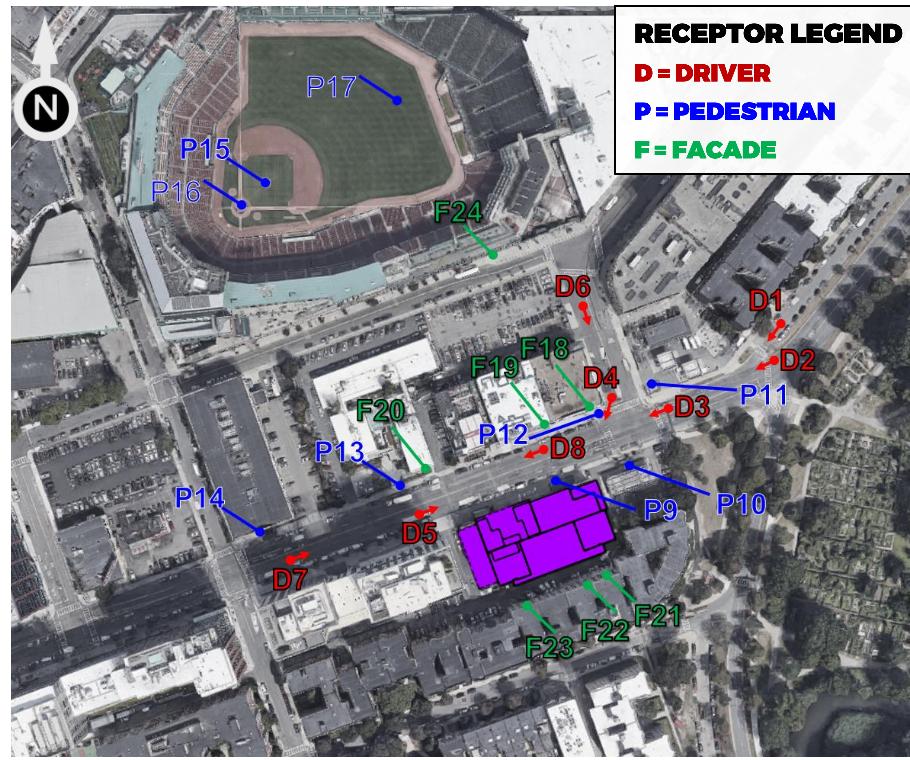


Figure 7: Receptor Locations (Map Underlay Credit: Google Maps)

DETAILED ANALYSIS RESULTS

Table 3 summarizes the level of visual and thermal impact from the development's reflections at each of the studied locations. For each category (visual impact, thermal impacts on people, thermal impacts on facades/property) the point is classified as experiencing one of three impact levels:

- **Low** impacts indicate that either no reflections reach the receptor, or that reflections which do reach the location are unlikely to lead to visual or thermal concerns.

- **Moderate** impacts indicate the potential for visual nuisance, minor thermal discomfort to people, or heating of materials. Moderate impacts do not indicate a significant safety risk and are common in urban areas. They represent effects such as intermittent visual glare on pedestrians or occupants of adjacent buildings which can be safely self-mitigated.

- **High** impacts indicate the potential for risks to safety, either through impairing the visual acuity of a vehicle operator or through reflection intensities high enough to cause injury or property damage. When the sun is also in a driver's field of view, we would expect that brightness of the sun to dominate over the less intense reflected light, likely reducing the perceived effect of high impact reflections. This situation is noted in Table 3 where applicable, as are notes on high impact reflection frequencies and durations.

The minute-by-minute results for each point are presented as 'Annual Reflection Impact Diagrams' which distill an entire years worth of data into a single diagram. The diagrams for each of the receptor points as well as an explanation for how to read the diagrams are provided in Appendix A.

For further detail on RWDI's criteria refer to Appendix B.

The level of mitigation required (discussed further in the Overall Observations & Conclusions section), is determined based on a combination of factors including the predicted level of impact, the frequency and duration of the impacts, and the risk level associated with activities likely to be engaged in at the location.

DETAILED ANALYSIS RESULTS

Table 3: Summary of Overall Predicted Impacts on Receptors

Receptor Number	Receptor Type	Assumed Activity Risk Level	Assumed Ability to Self-Mitigate	Peak Reflected Light Visual Impact	Sun in Field of View During High Impact Reflection	Duration / Number of Days with High Impact Reflection	Peak Reflected Solar Thermal Impact on People	Peak Reflected Solar Thermal Impact on Facade
D1	Driver	High	Low	***High***	***No***	Longest Duration: **13 minutes** Average Duration: **5 minutes** No. of days: **48**	***Low***	N/A
D2	Driver	High	Low	***Moderate***	N/A	N/A	***Low***	N/A
D3	Driver	High	Low	***High***	***Some Impacts***	Longest Duration: **17 minutes** Average Duration: **6 minutes** No. of days: **62**	***Low***	N/A
D4	Driver	High	Low	***High***	***No***	Longest Duration: **20 minutes** Average Duration: **5 minutes** No. of days: **148**	***Low***	N/A
D5	Driver	High	Low	***High****	***Yes***	Longest Duration: **9 minutes** Average Duration: **4 minutes** No. of days: **79**	***Low***	N/A
D6	Driver	High	Low	***Moderate***	N/A	N/A	***Low***	N/A
D7	Driver	High	Low	***Moderate***	N/A	N/A	***Low***	N/A
D8	Driver	High	Low	***Moderate***	N/A	N/A	***Low***	N/A

***** The high impact reflections are infrequent and short in duration.

Table 3: Summary of Overall Predicted Impacts on Receptors (continued)

Receptor Number	Receptor Type	Assumed Activity Risk Level	Assumed Ability to Self-Mitigate	Peak Reflected Light Visual Impact	Sun in Field of View During High Impact Reflection	Duration / Number of Days with High Impact Reflection	Peak Reflected Solar Thermal Impact on People	Peak Reflected Solar Thermal Impact on Facade
P9-P13	Pedestrian	Low	High	***Moderate***	N/A	N/A	***Low***	N/A
P14	Pedestrian	Low	High	***Low***	N/A	N/A	***Low***	N/A
P15-P17	Pedestrian (Fenway Park)	Low	High	***Low***	N/A	N/A	***Low***	N/A
F18-F20	Facade	Low	High	***Moderate***	N/A	N/A	N/A	***Low***
F21-F23	Facade	Low	High	***Moderate***	N/A	N/A	N/A	***Low***
F24	Facade	Low	High	***Moderate***	N/A	N/A	N/A	***Low***

Visual Glare Impact on Drivers

1. As with the addition of any glazed building, drivers travelling in the vicinity of the buildings are expected to experience an increased level of visual glare impact. Some reflections with a high visual impact potential were noted. Some of these impacts may alter a driver's experience since the glare occurs at times when the sun would not be within a driver's field-of-view. In particular, a driver's experience could be altered when:

   - Travelling west on Boylston St. approaching Park Dr. (receptor D1);
   - Travelling west on Boylston St approaching Ipswich St. (receptor D3); and
   - Travelling south on Ipswich St. approaching Boylston St. (receptor D4)

   The high impact reflections predicted at these locations can last up to 20 minutes, but on average last about 5 minutes. The impacts on Boylston St. approaching Park Dr. (receptor D1) can occur between 4:00 pm EST and 4:40 pm EST in most of March, and from 3:50 pm EST to 4:25 pm EST from mid-September to mid-October. The impacts on Boylston St. approaching Ipswich St. (receptor D3) occur from 4:10 pm EST to 4:55 pm EST from mid-February to mid-March; from 4:50 pm EST to 5:15 pm EST in the middle two weeks of April, and in the last ten days of August; and from 3:50 pm EST to 4:30 pm EST during the last week of September, and the first three weeks of October. Impacts also occur intermittently at Ipswich St. turning onto Boylston St. (receptor D4) from 7:10 am EST to 9:40 am EST from early January to mid-March, and again from early October to end-December.

   The majority of these impacts are infrequent and short in duration, and they only occur at less than 0.7% of the daytime annually. In addition, while the sun is not directly within the driver's field of view during the impacts on the westbound drivers (receptors D1 and D3), this is due to the sun being shadowed by a surrounding building rather than due to its position in the sky. Thus, the drivers would likely already be expecting a bright light source driving in that direction and have taken mitigation measures (i.e. lowering the sun visor, and/or putting on sunglasses).

Visual Glare Impact on Drivers (continued)

2. The remainder of high impact glare events predicted in this analysis occur at times when the sun would also be in a driver's field-of-view. This represents a situation where a driver would already experience intense glare from the sun at that time, likely reducing the perceived impact of any reflected light due to both the intensity of the sun compared to the reflection, but also because a driver would already expect glare to occur at that time from that location. This analysis predicts the potential for such impacts for drivers traveling eastbound on Boylston St. from Jersey St. to the development (receptor D5), as well as for some impacts on westbound drivers on Boylston St (Receptor D3). Impacts at these receptors are generally short in duration, infrequent, and at most occur in less than 0.2% of the daytime annually).
3. For the remainder of the driver receptors, visual glare impacts are predicted to be moderate at worst, and therefore are not expected to pose a safety concern to drivers. For further details refer to the visual impact diagrams for all driver receptors (D1-D8) illustrated in Appendix A.

Visual Glare Impacts on Pedestrians and Facades

4. Moderate levels of visual impact are predicted to fall on most of the pedestrian and facade receptors studied in this analysis. The exceptions to this is the receptor representing pedestrians at the corner of Boylston St. and Jersey St. (receptor P14) and the receptor representing the facade of Fenway Park (receptor P24), where no impact is predicted.
5. Impacts to the rear facades of residences on Peterborough St. (F21-F23) are predicted to be moderate. Majority of the reflections occur in the middle of the day when the residential buildings are less likely to be occupied. Any reflections that do reach these areas have a mean duration of less than 15 minutes, and can only occur in less than 17% of the daytime.
6. The potential visual impacts noted above do not present a safety risk, but rather a temporary nuisance at worst which can be mitigated by briefly closing blinds or looking away from the glare source.
7. No visual impact was noted within Fenway Park.

OVERALL OBSERVATIONS & CONCLUSIONS

Thermal Impacts on People

8. The planar facades of the proposed development ensure that reflected sunlight will not focus (multiply) in any particular area. Therefore, RWDI does not expect any significant thermal impacts (i.e. risks to human safety or property damage) to occur either on the site of the development or in the surrounding neighborhood.

Thermal Impacts on Facades

9. The majority of reflected solar energy at the studied facade areas are of a low intensity (less than 500 W/m^2) and short duration. Hence, we would not expect these reflections to lead to a significant additional cooling load for a building. Should an individual choose to expose themselves to the reflected energy, they may feel warm however this would be a temporary experience and once which would be remedied by closing window treatments.

MITIGATION SUGGESTIONS

Overall, the reflections emanating from the proposed SCAPE development onto the surrounding neighborhood are comparable to reflections elsewhere in the city. If however, there are concerns about the predicted reflection impacts, RWDI offers the following suggestions for further consideration (refer to Figures 8 and 9 on the following two pages for a mark-up of these recommendations):

1. **Building Mounted Shading Devices:** The impacts effecting the westbound driver receptors on Boylston St. (receptors D1 and D3) could be reduced by constructing physical blockages. In particular, employing vertical mullion fins approximately 6 to 8 inches deep in the locations highlighted in red and orange in Figure 8 would reduce the frequency and duration of high-impact reflections falling onto these receptors.

   Additionally, the impacts effecting eastbound drivers on Boylston St. (receptors D5) could be reduced or eliminated outright by employing vertical mullion fins approximately 2 to 4 inches deep in the locations highlighted in blue in Figure 8.

   For the southbound drivers on Ipswich St. (receptor D4), the impacts could be reduced by employing vertical mullion fins approximately 12 to 15 inches deep in the locations highlighted in red in Figure 9. However these fins would not fully eliminate the impacts, therefore an alternative mitigation strategy has been suggested for this region.

It should be noted that building mounted shading devices need careful design to ensure that they do not lead to potential problems with wind induced noise or vibration, snow and ice build up, etc. Thus, if mitigation via facade mounted shading structures is desired, RWDI would recommend re-running the simulations with the proposed shading devices included to predict their effectiveness.

2. **Glazing Surface Modification:** An alternative approach to reduce the impacts on the driver receptor D4 would be to modify the exterior surface of the east facade (areas highlighted in red in Figure 9) to diffuse reflected light, i.e. by “frosting” or roughening the exterior surface.

MITIGATION SUGGESTIONS

Employing vertical mullion fins on these areas would act to reduce the frequency and duration of the high impacts which occur at receptor point D1. The required depth of the fins would be approximately 6-8 inches.

Similar adjustments on the highlighted area (6-8 inch deep vertical fins) would lower the impacts on receptor D3.

Mounting vertical fins with smaller depth size (approximately 2-4 inches) on these areas could decrease or eliminate outright the impacts on D5.

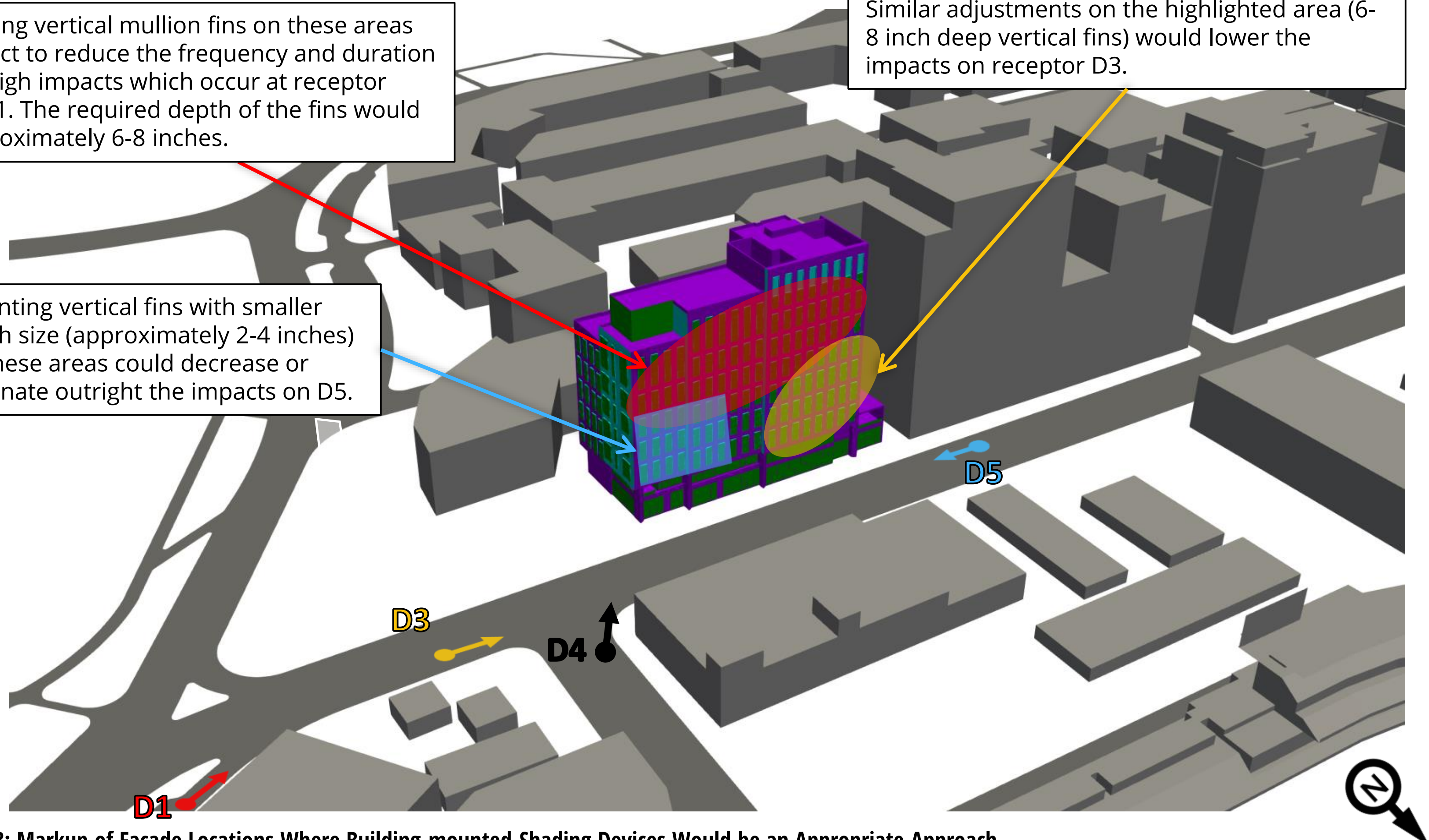


Figure 8: Markup of Facade Locations Where Building-mounted Shading Devices Would be an Appropriate Approach

MITIGATION SUGGESTIONS

Employing vertical mullion fins on these areas would reduce the frequency and duration of the high impacts on receptor D4. The required depth of the fins would be approximately 12-15 inches.

Modifying the exterior surface of a section of this facade to diffuse reflected light by "frosting" or roughening the exterior surface would be an alternative approach to reduce the high impacts at D4.

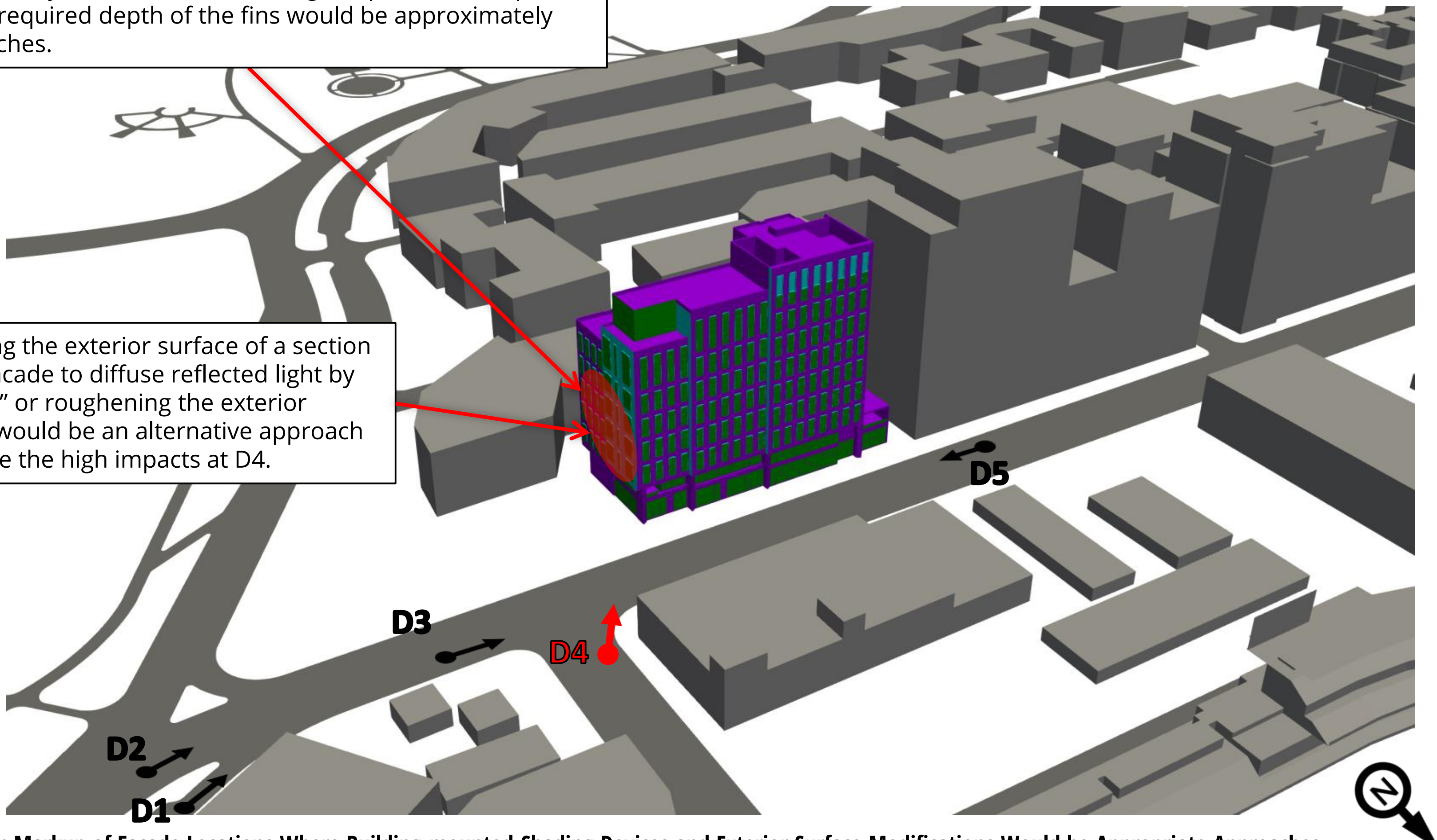


Figure 9: Markup of Facade Locations Where Building-mounted Shading Devices and Exterior Surface Modifications Would be Appropriate Approaches

APPENDIX A

ANNUAL REFLECTION IMPACT DIAGRAMS

Presentation of Results

The frequency, duration, and intensity of glare events throughout the year is illustrated using “annual impact diagrams” (see Figure A1 below for the general layout of these plots). The color of the plot for a given combination of date and time indicates the relative impact of any glare sources found. The horizontal axis of the diagram indicates the date, and the vertical axis indicates the hour of the day.

We note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

The following pages present the impact categories for three types of Annual Impact Diagrams: Visual Impact, Thermal Impact on People, and Thermal Impact on Property. More information on RWDI’s criteria is available in Appendix B.

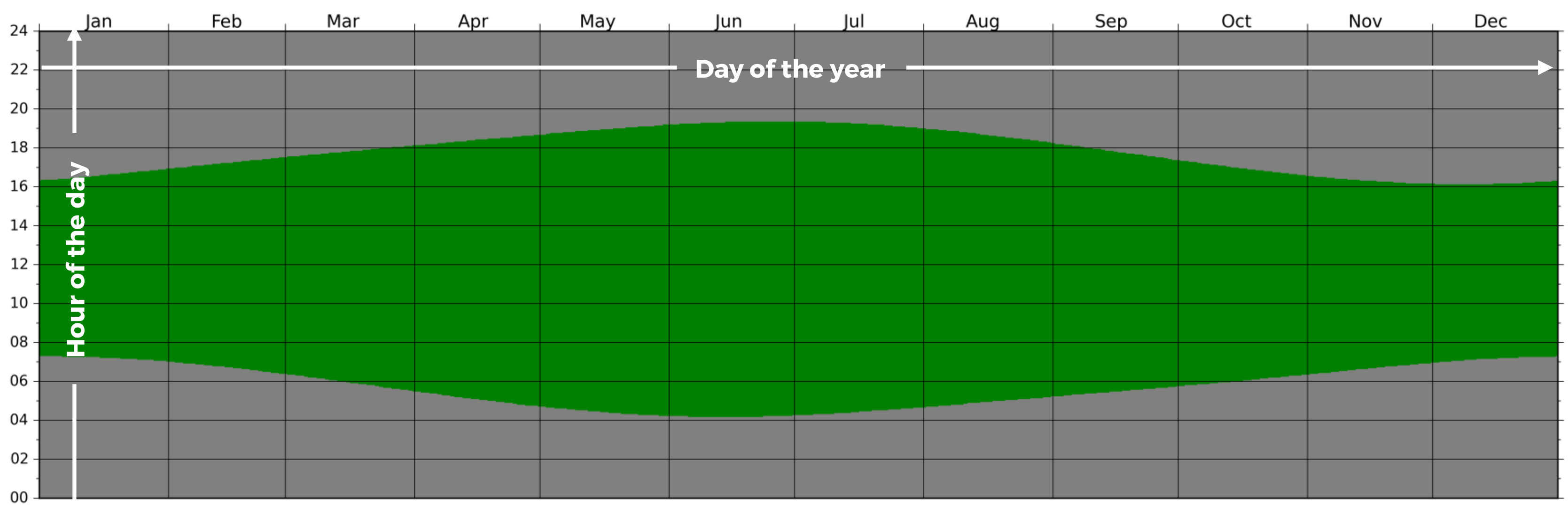


Figure A1: Layout of Annual Reflection Impact Diagram

Visual Impact Categories

Low: Either no significant reflections occur or the reflections will have a minimal effect on a viewer, even when looking directly at the source.

Moderate: The reflections can cause some visual nuisance only to viewers looking directly at the source.

High: The reflections can reduce visual acuity for viewers operating vehicles or performing other high-risk tasks who are unable to look away from the source, posing a significant risk of distraction.

Damaging: The brightest glare source is bright enough to permanently damage the eye for a viewer looking directly at the source.

Hatched areas indicate times and dates when the sun would also be in a driver's field of view.

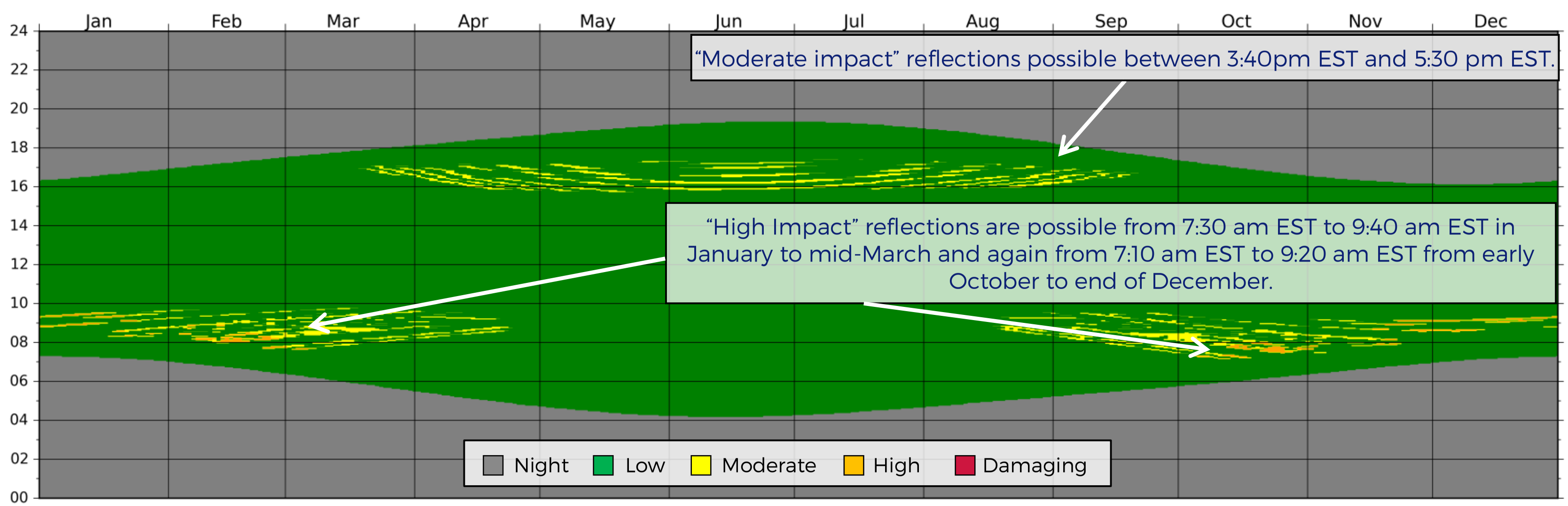


Figure A2: Example of Annual Visual Glare Impact Diagram – Receptor D4

Thermal Impact Categories for People

Low: Either no significant reflections occur or the reflection intensity is below the short-term exposure threshold of 1500 W/m².

Moderate: The reflection intensity is above the short-term exposure threshold of 1500 W/m² but below the safety threshold of 2500 W/m². Such reflections would quickly cause thermal discomfort in people.

High: The reflection intensity is above the safety threshold of 2500 W/m² but below 3500 W/m². This level of exposure to bare skin would lead to the onset of pain within 30 seconds.

Very High: Reflection intensity exceeds 3500 W/m². This level of exposure leads to second degree burns on bare skin within 1 minute.

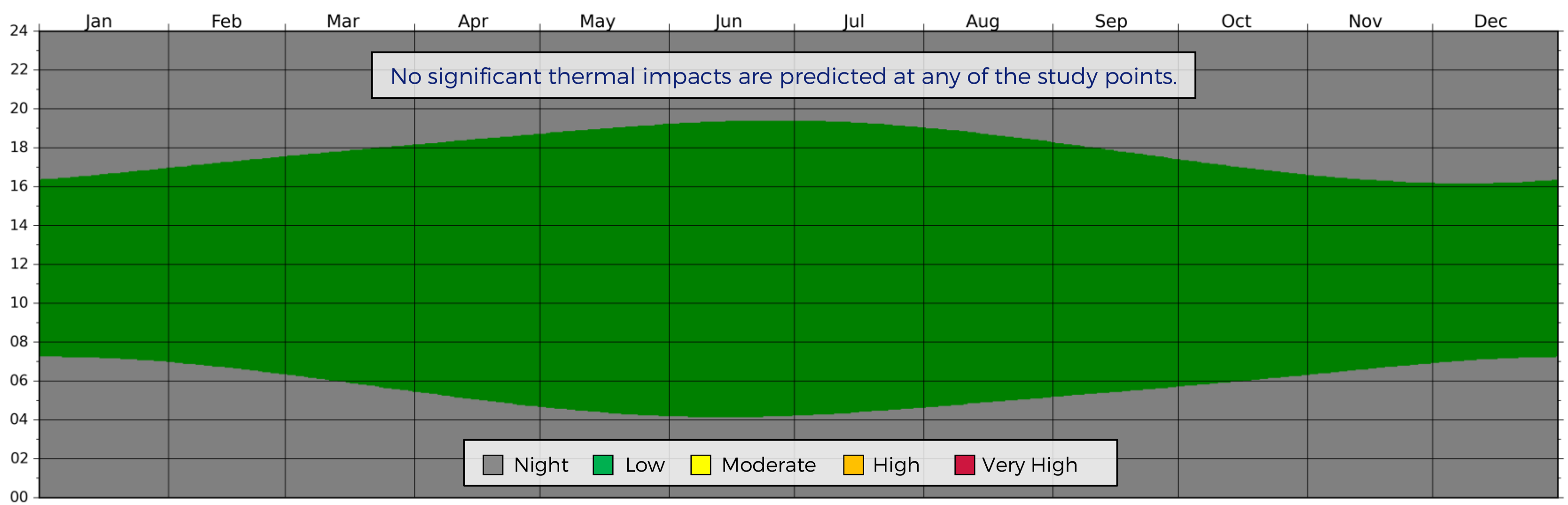


Figure A3: Example of Annual Pedestrian Thermal Impact Diagram – Receptor P9

Thermal Impact Categories for Property

A different scale is used to illustrate the reflected thermal energy on facades in order to provide further clarity on the potential for heat gain issues. The diagrams illustrate the irradiance levels of all predicted reflection events along with their frequency and duration.

The format of the diagram is similar to the diagrams described in the previous pages. The color of the plot for a given combination of date and time indicates the intensity of the reflected light at that point in time.

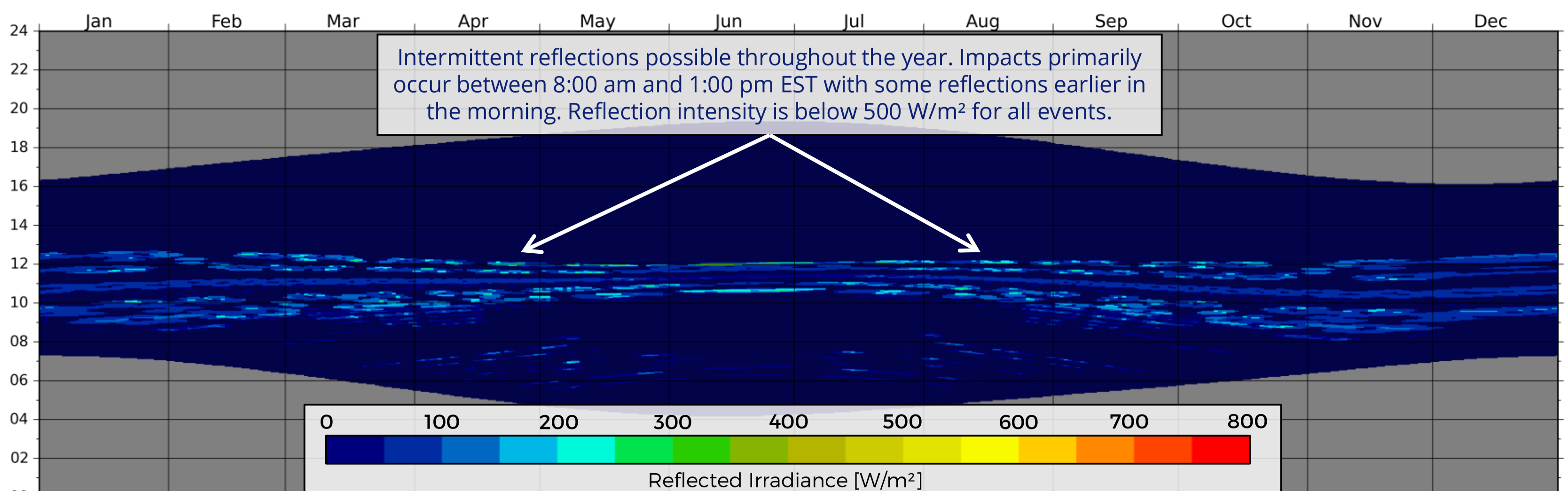


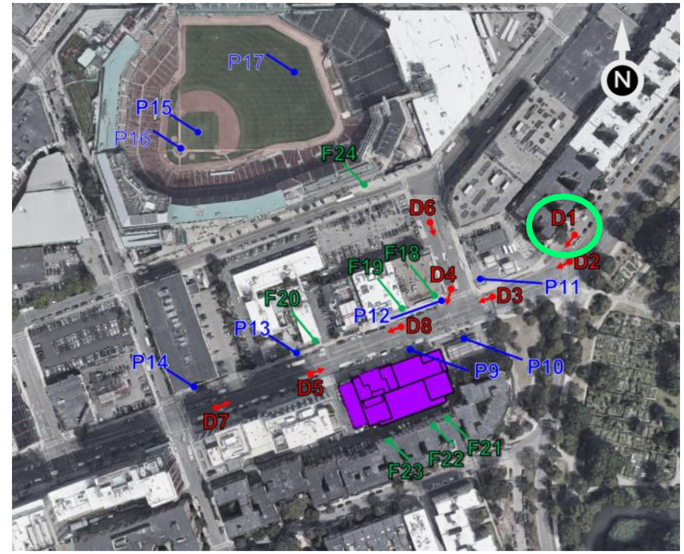
Figure A4: Example of Annual Property Thermal Impact Diagram – Receptor F23

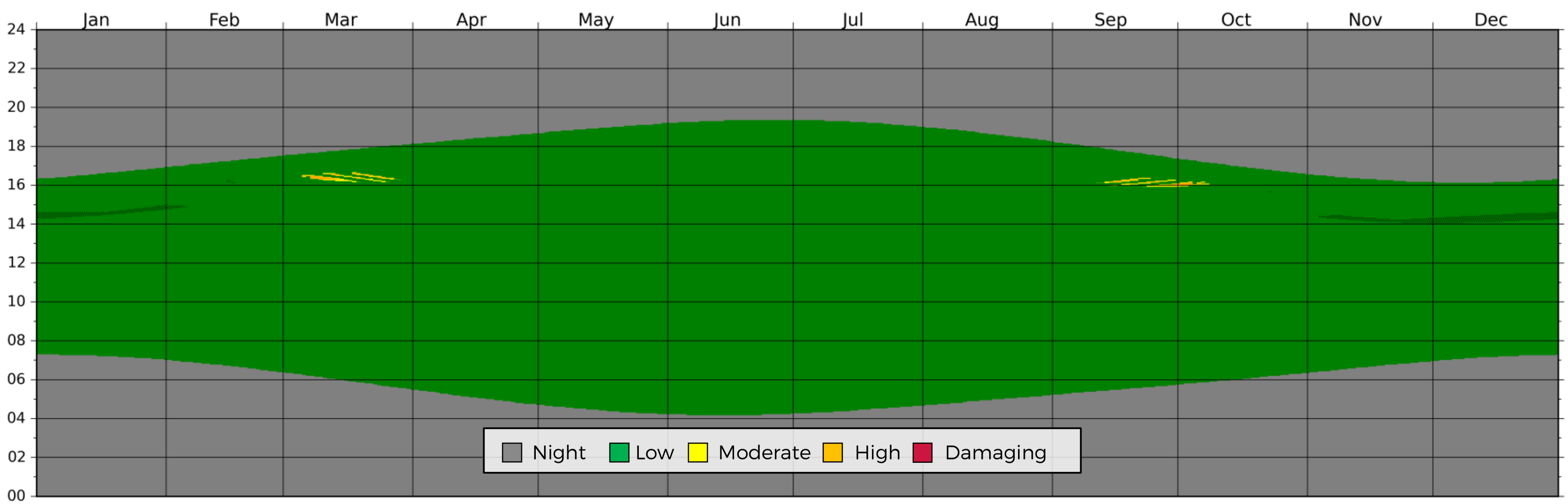
Driver Receptor D1

Receptor D1 was chosen to assess the visual impact associated with solar reflections affecting drivers travelling west along Boylston St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.





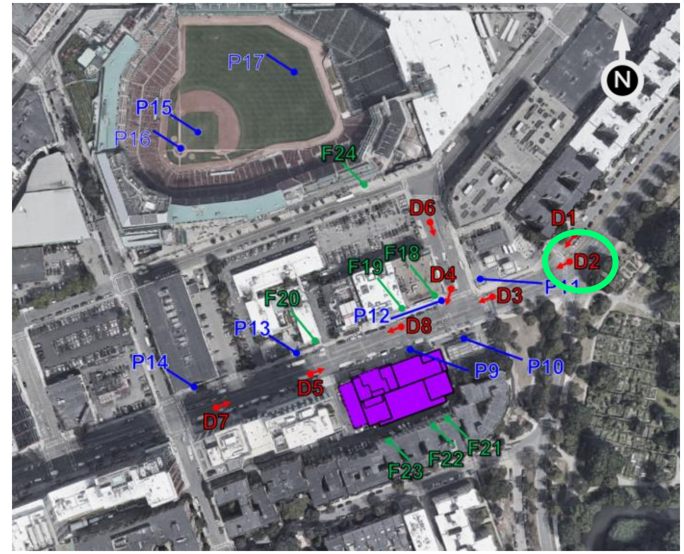
ANNUAL VISUAL IMPACT

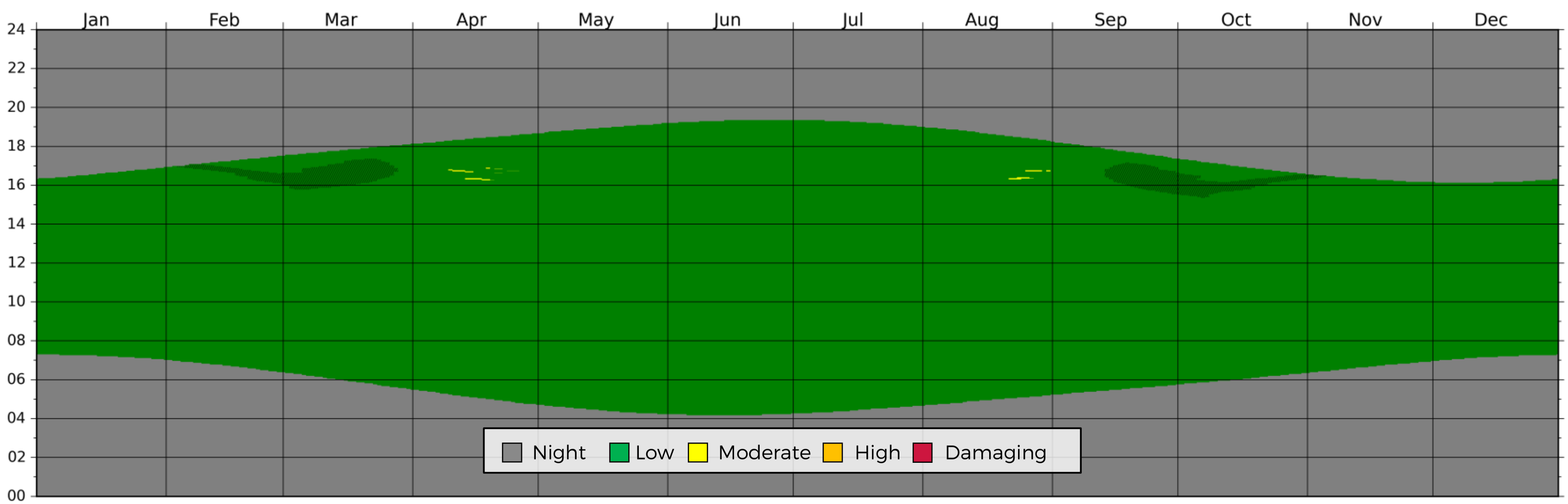
Driver Receptor D2

Receptor D2 was chosen to assess the visual impact associated with solar reflections affecting drivers travelling west along Boylston St. at Park Dr.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.



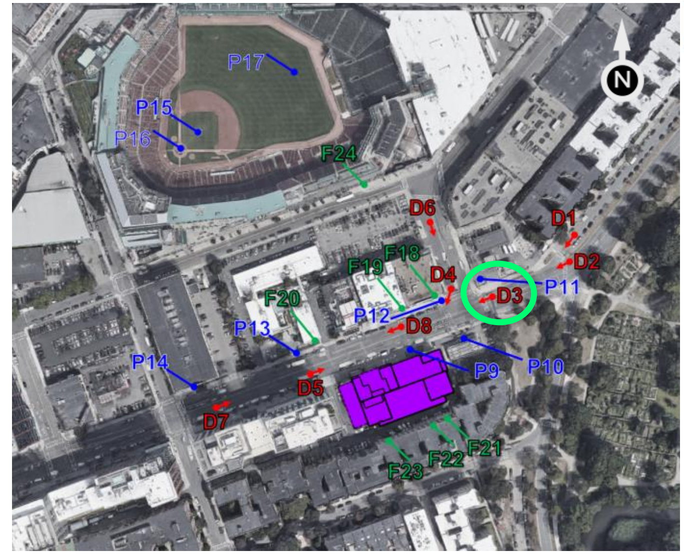


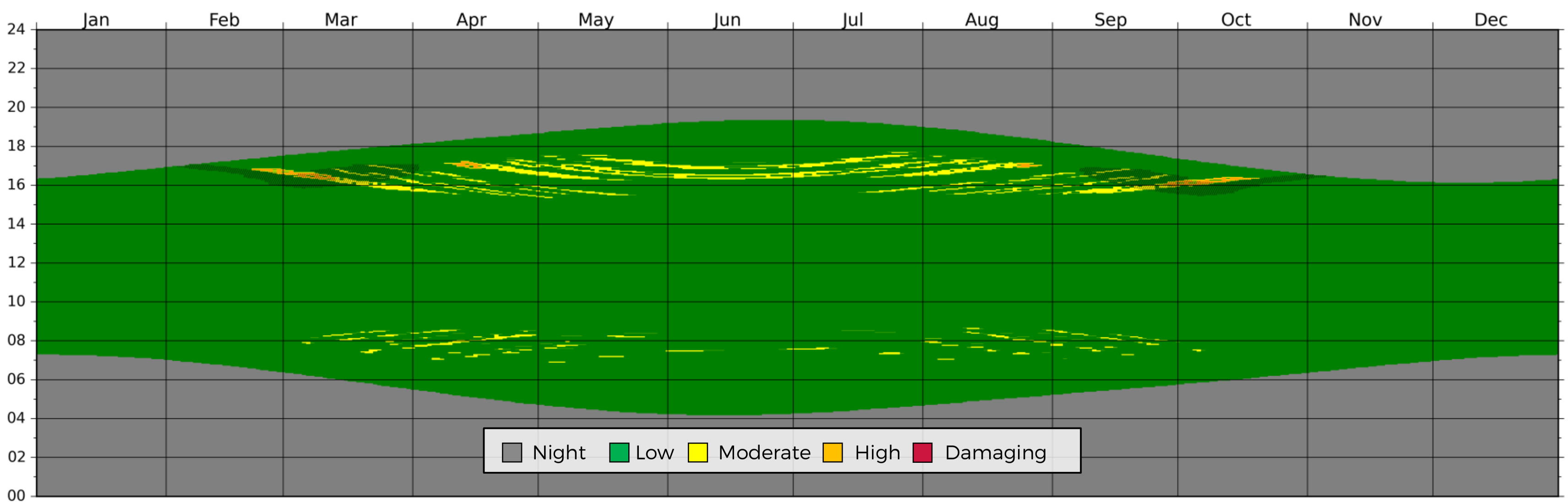
Driver Receptor D3

Receptor D3 was chosen to assess the visual impact associated with solar reflections affecting drivers travelling west along Boylston St. at Ipswich St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.

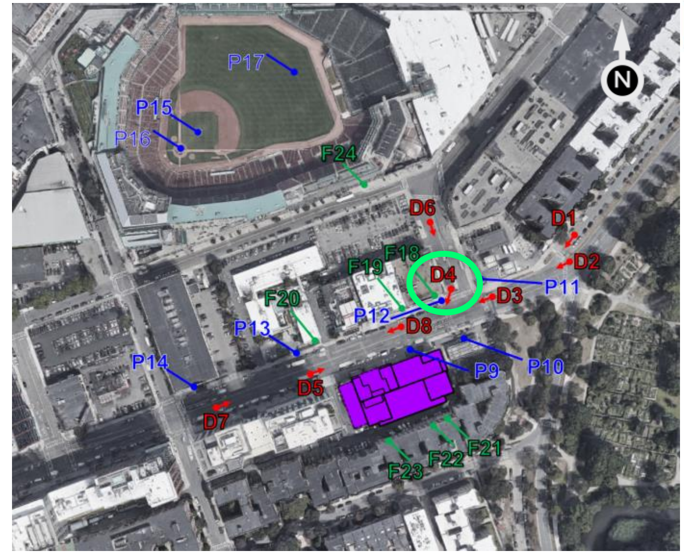


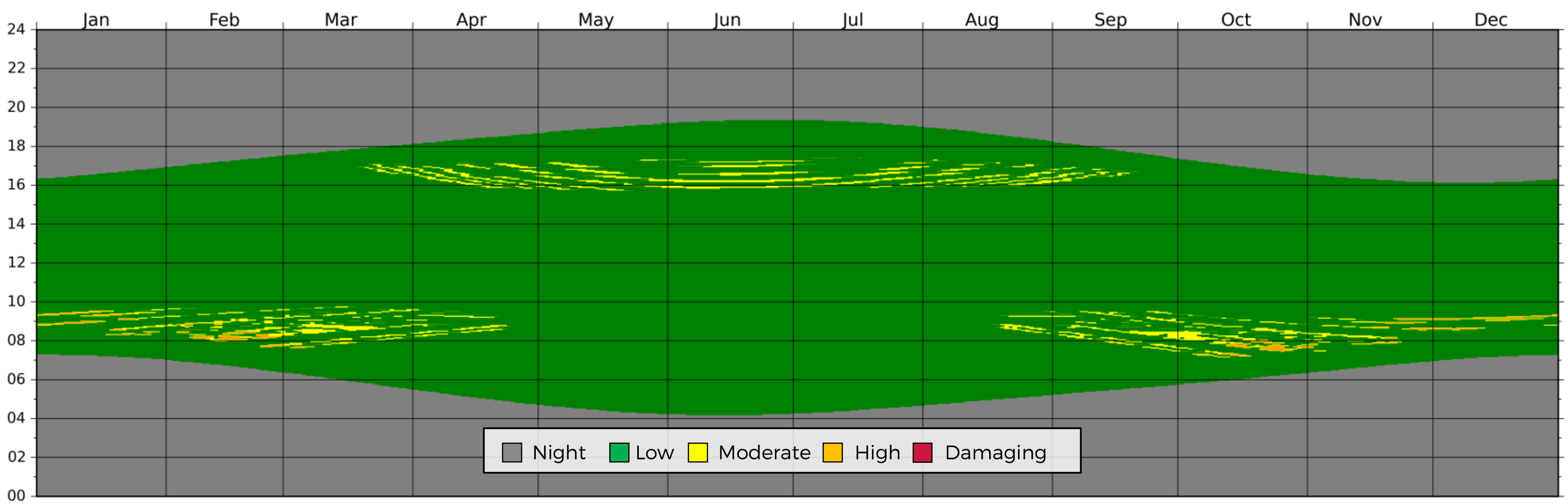


Driver Receptor D4

Receptor D4 was chosen to assess the visual impact associated with solar reflections affecting drivers travelling south along Ipswich St. at Boylston St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



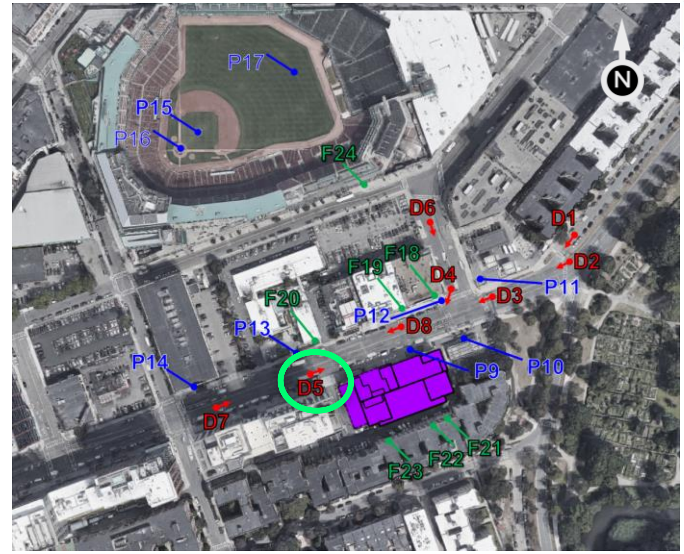


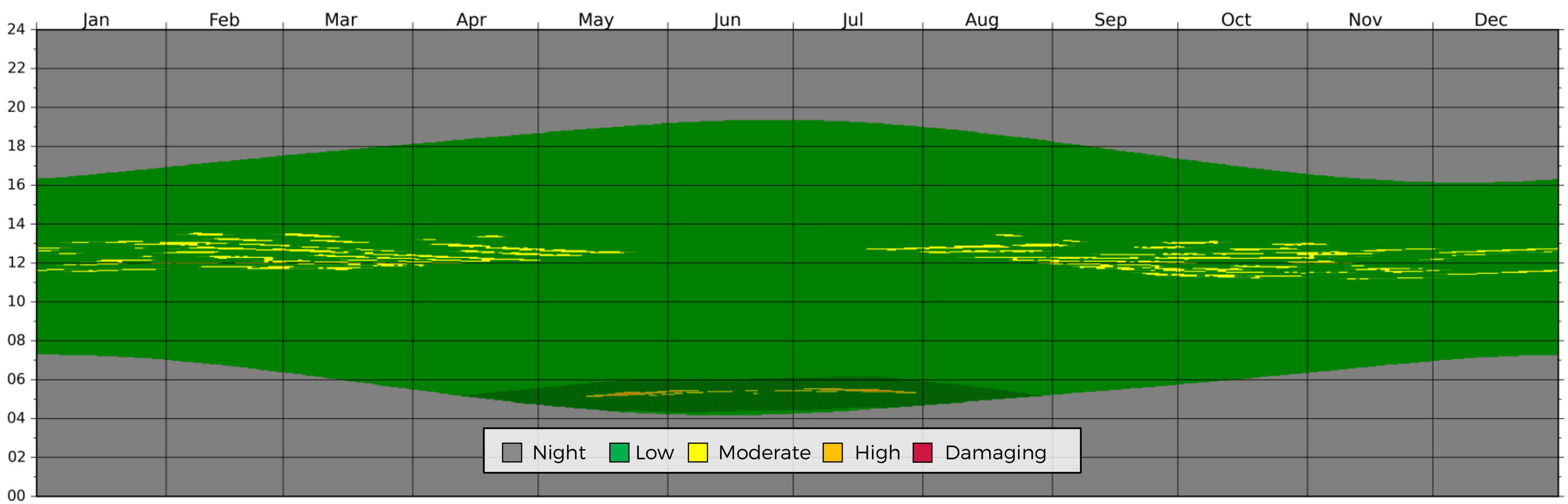
Driver Receptor D5

Receptor D5 was chosen to assess the visual impact associated with solar reflections affecting drivers travelling east along Boylston St. approaching the building at the alleyway.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.

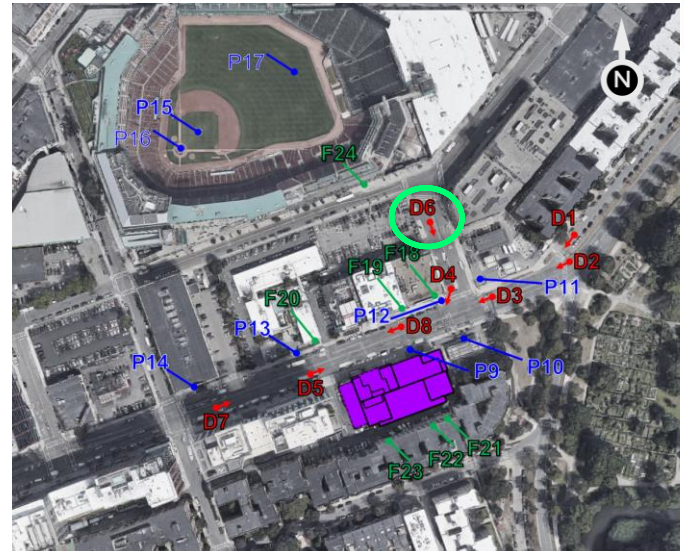


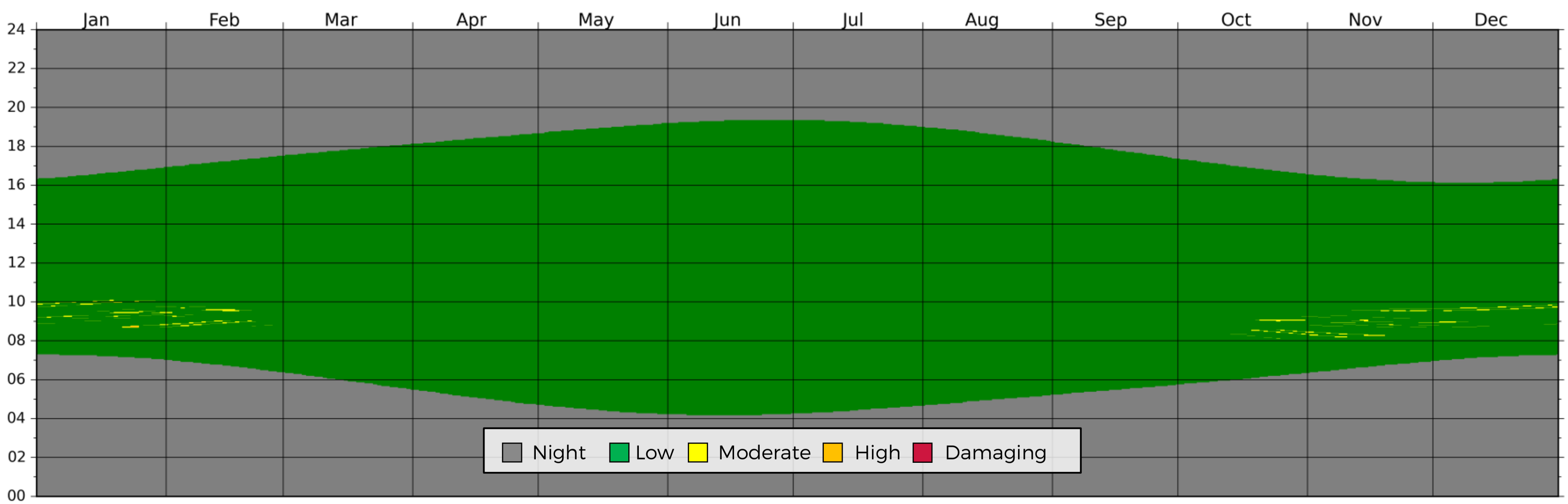


Driver Receptor D6

Receptor D6 was chosen to assess the visual impact associated with solar reflections affecting drivers travelling south along Ipswich St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.





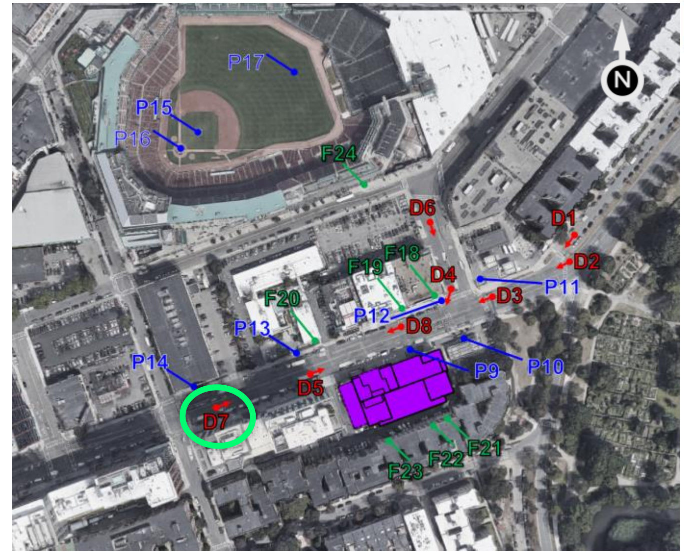
ANNUAL VISUAL IMPACT

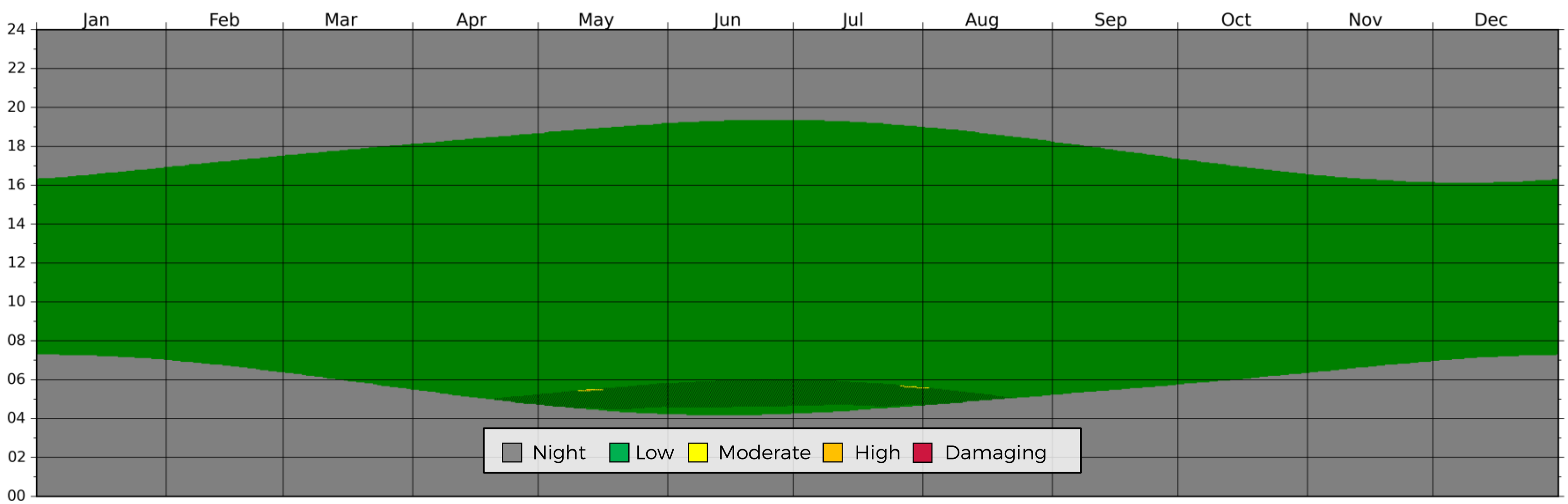
Driver Receptor D7

Receptor D7 was chosen to assess the visual impact associated with solar reflections affecting drivers travelling east along Boylston St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.





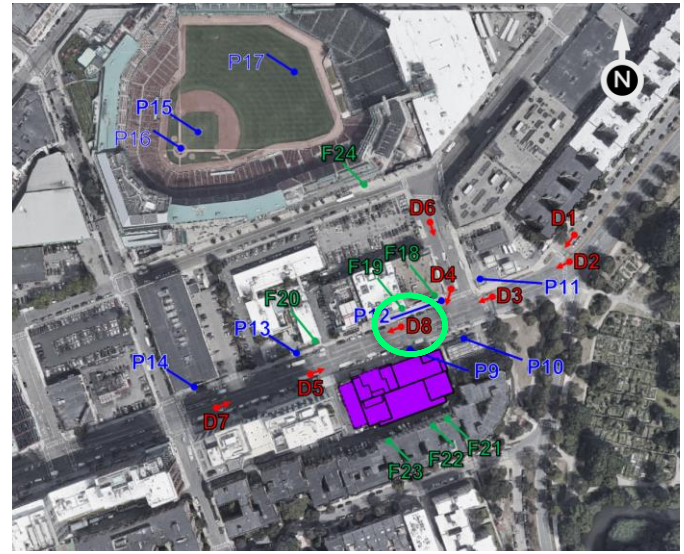
ANNUAL VISUAL IMPACT

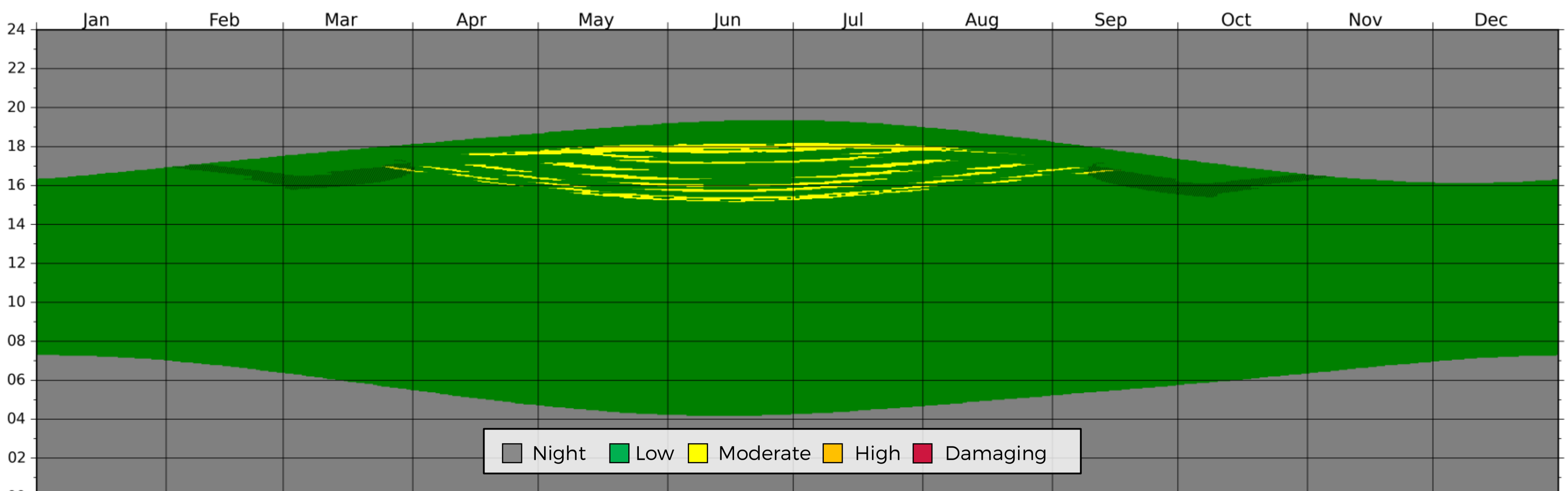
Driver Receptor D8

Receptor D8 was chosen to assess the visual impact associated with solar reflections affecting drivers travelling west along Boylston St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.

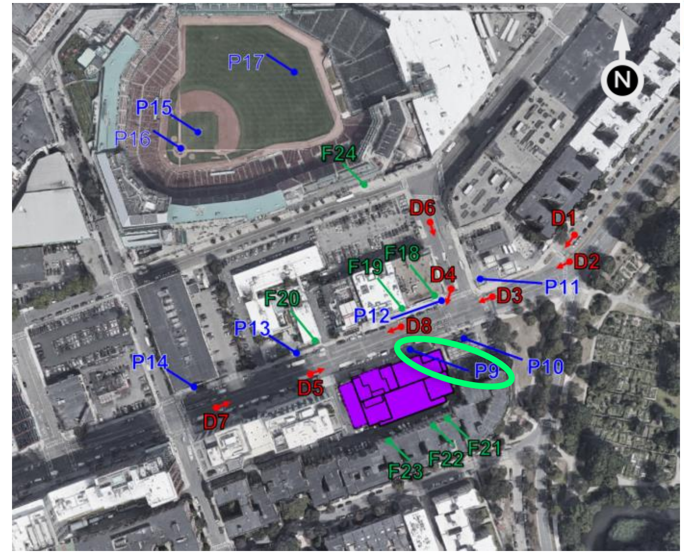


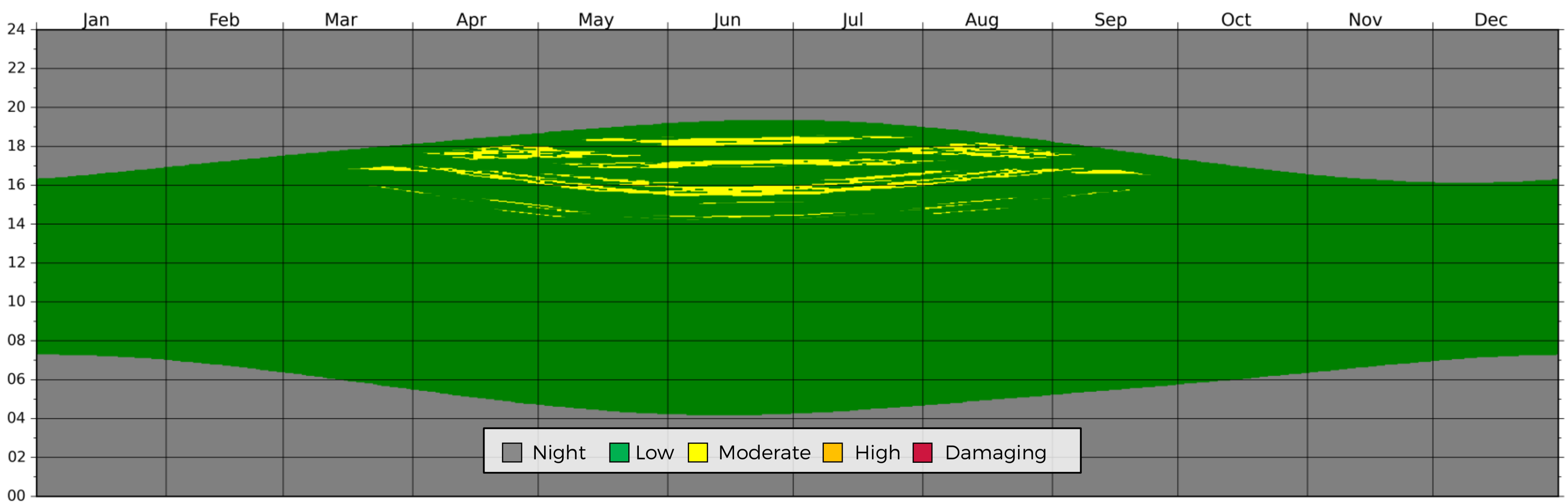


Pedestrian Receptor P9

Receptor P9 was chosen to assess the visual impact associated with solar reflections affecting pedestrians on the south side of Boylston St. in front of the proposed building.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



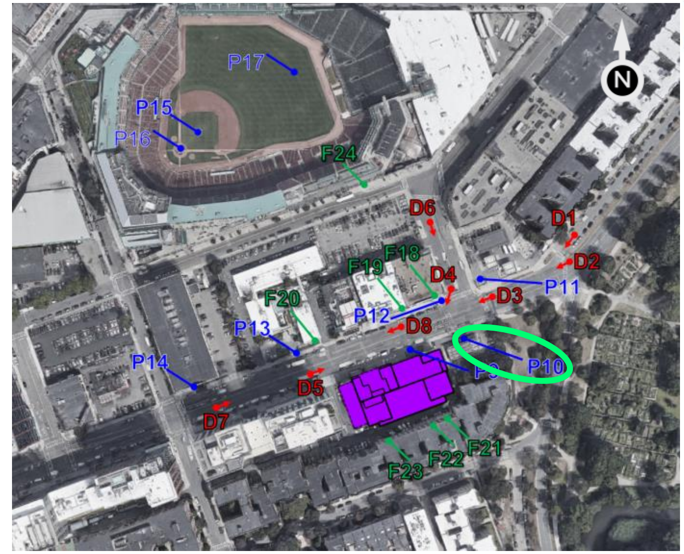


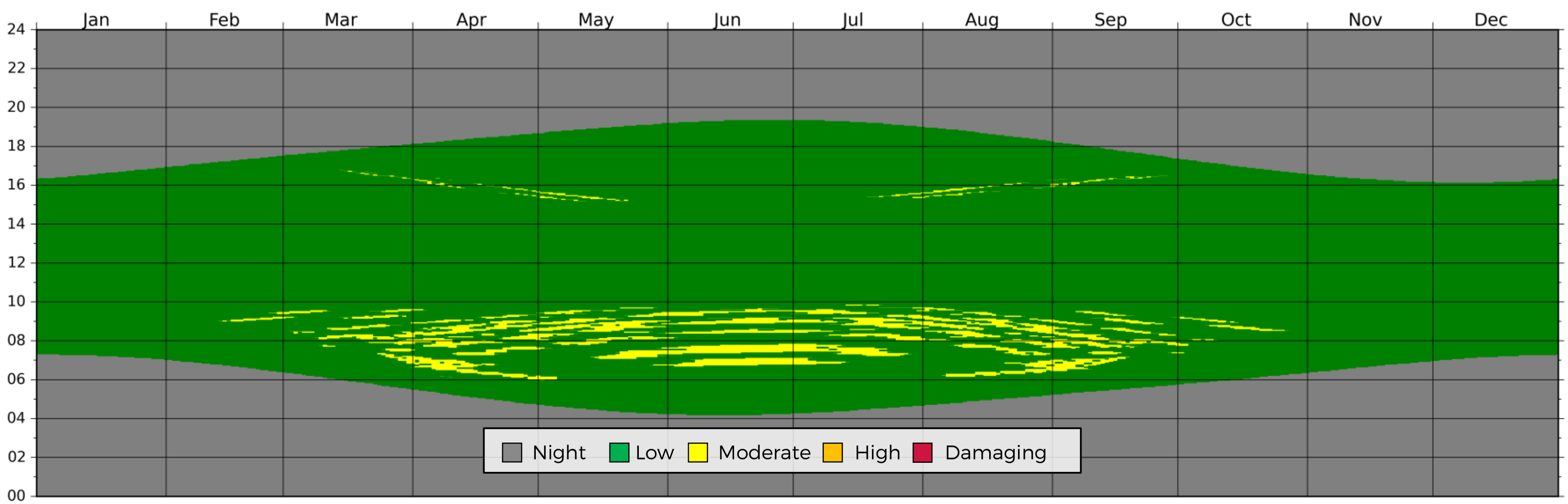
ANNUAL VISUAL IMPACT

Pedestrian Receptor P10

Receptor P10 was chosen to assess the visual impact associated with solar reflections affecting pedestrians on the south side of Boylston St. at the pedestrian crossing towards Ipswich St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

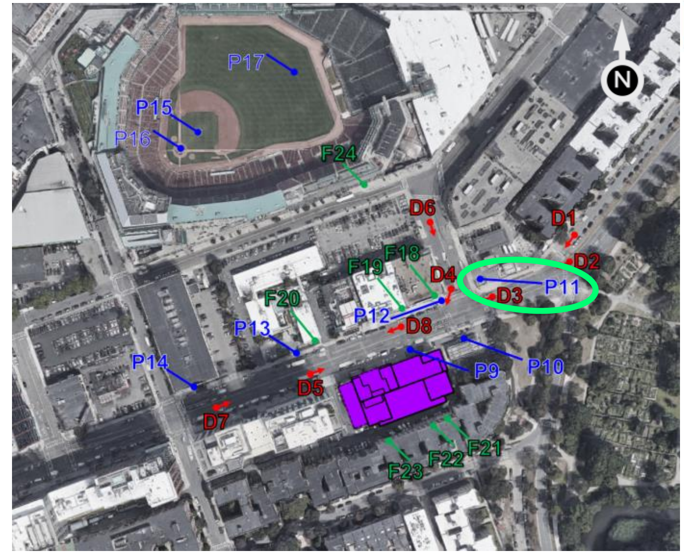


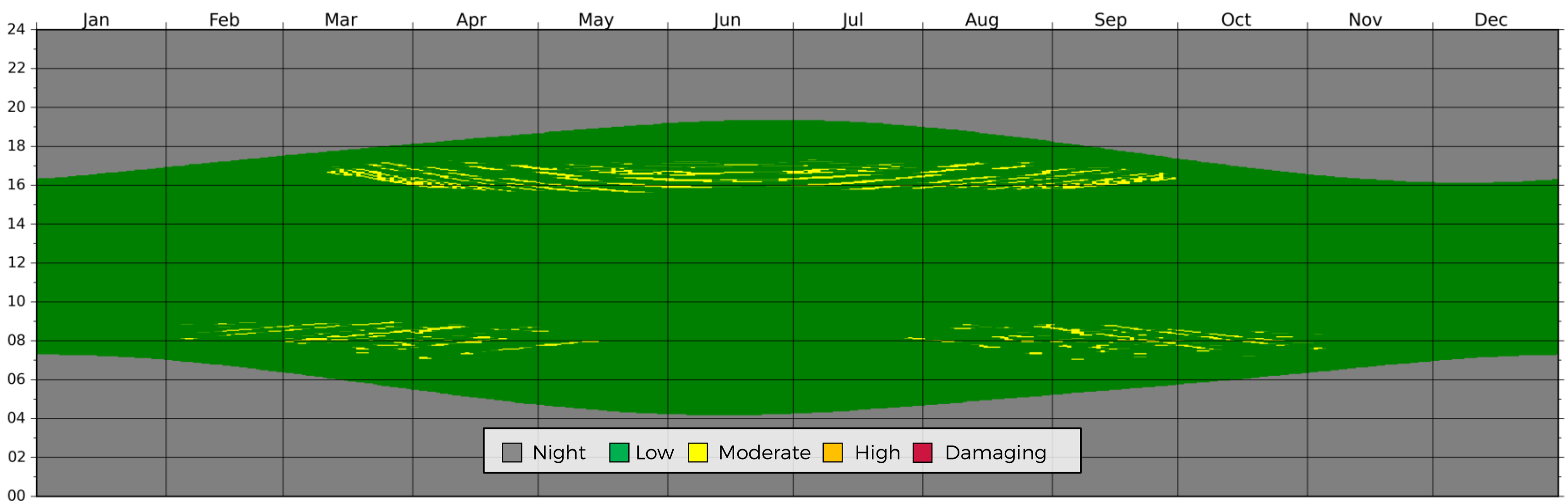


Pedestrian Receptor P11

Receptor P11 was chosen to assess the visual impact associated with solar reflections affecting pedestrians on the north side of Boylston St. at the pedestrian crossing across Ipswich St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

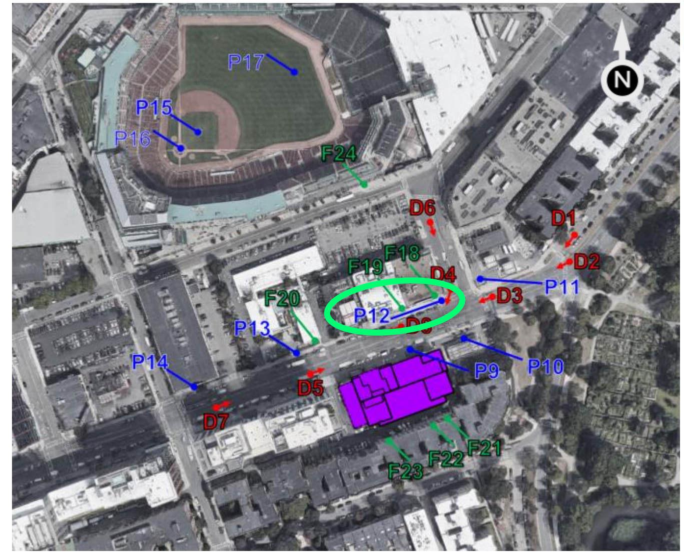


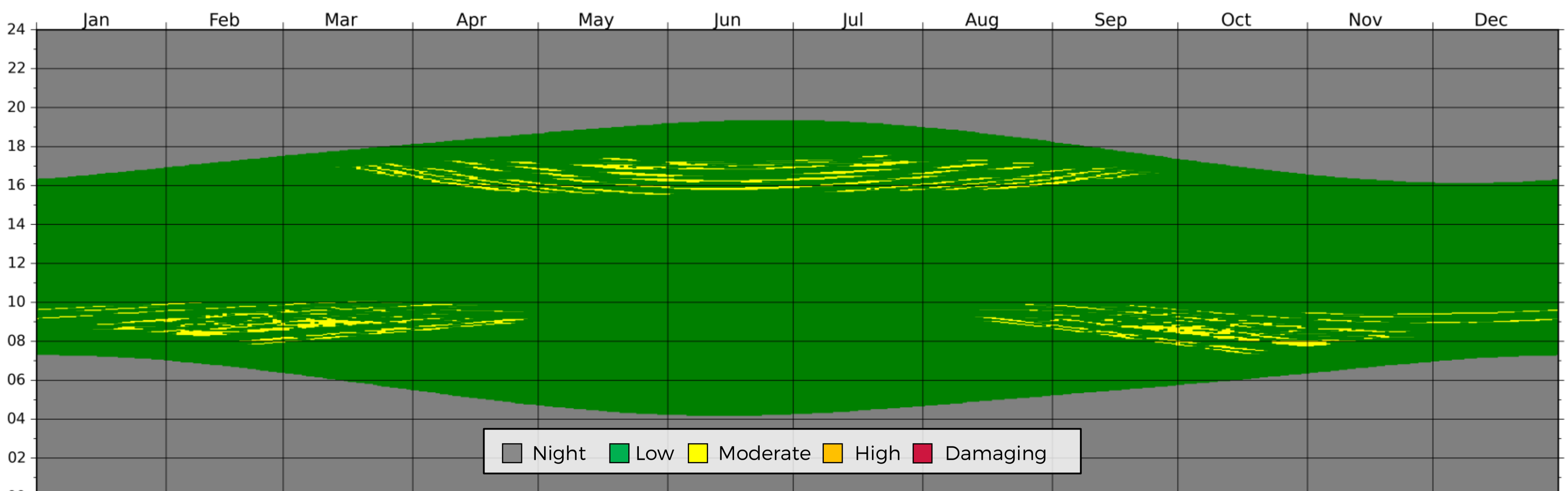


Pedestrian Receptor P12

Receptor P12 was chosen to assess the visual impact associated with solar reflections affecting pedestrians on the north side of Boylston St. at the pedestrian crossing across Ipswich St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



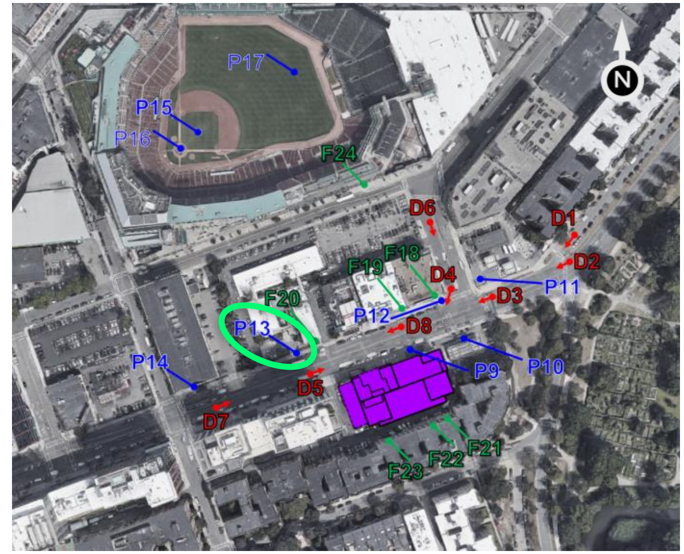


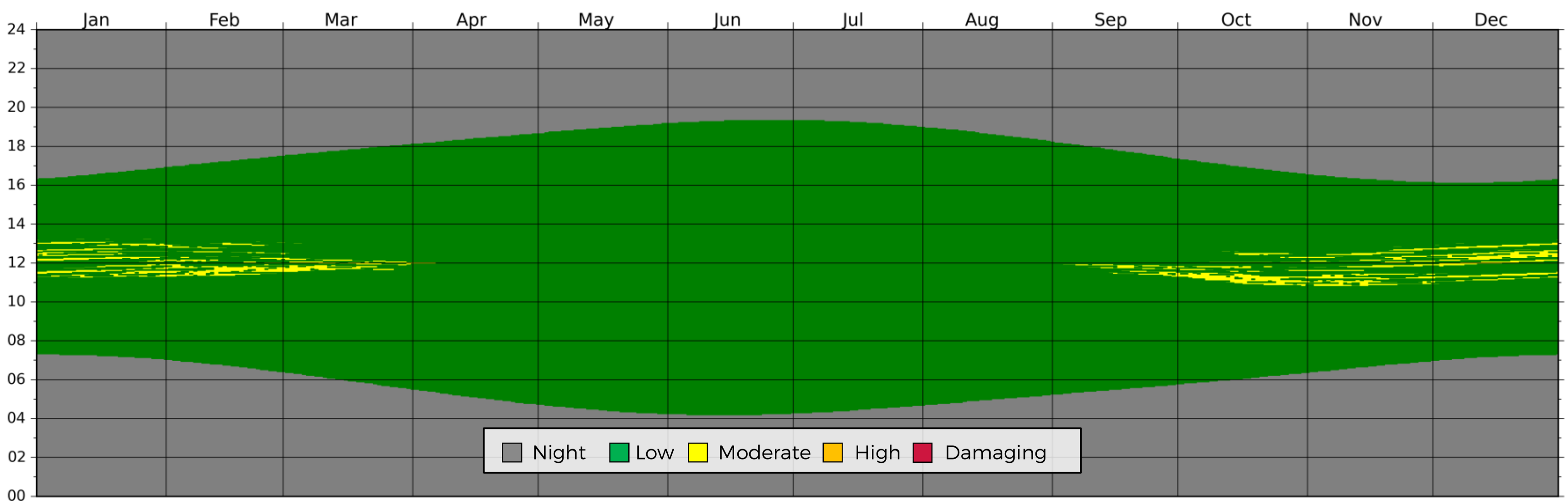
ANNUAL VISUAL IMPACT

Pedestrian Receptor P13

Receptor P13 was chosen to assess the visual impact associated with solar reflections affecting pedestrians on the north side of Boylston St. northwest of the building.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



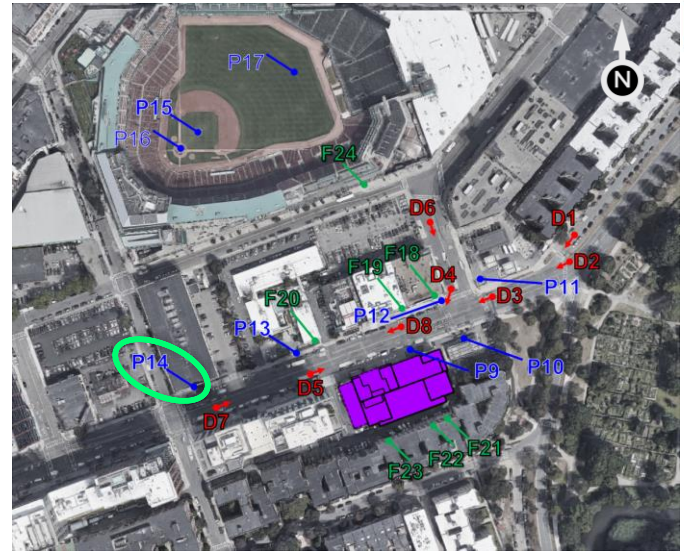


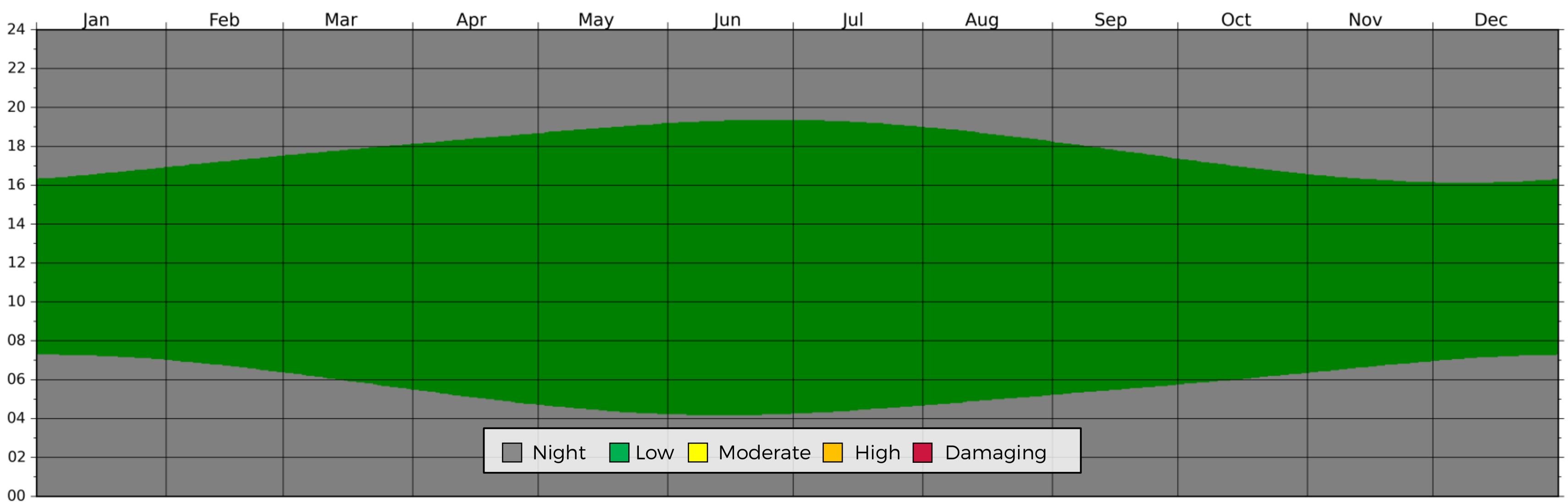
ANNUAL VISUAL IMPACT

Pedestrian Receptor P14

Receptor P14 was chosen to assess the visual impact associated with solar reflections affecting pedestrians on the north side of Boylston St.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

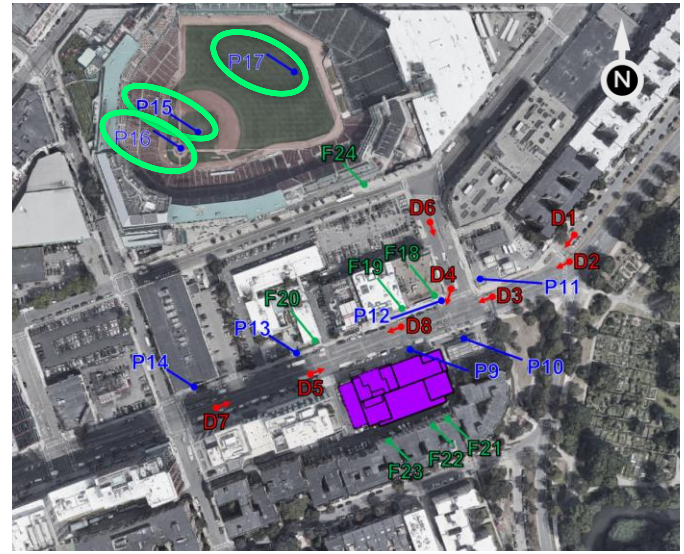


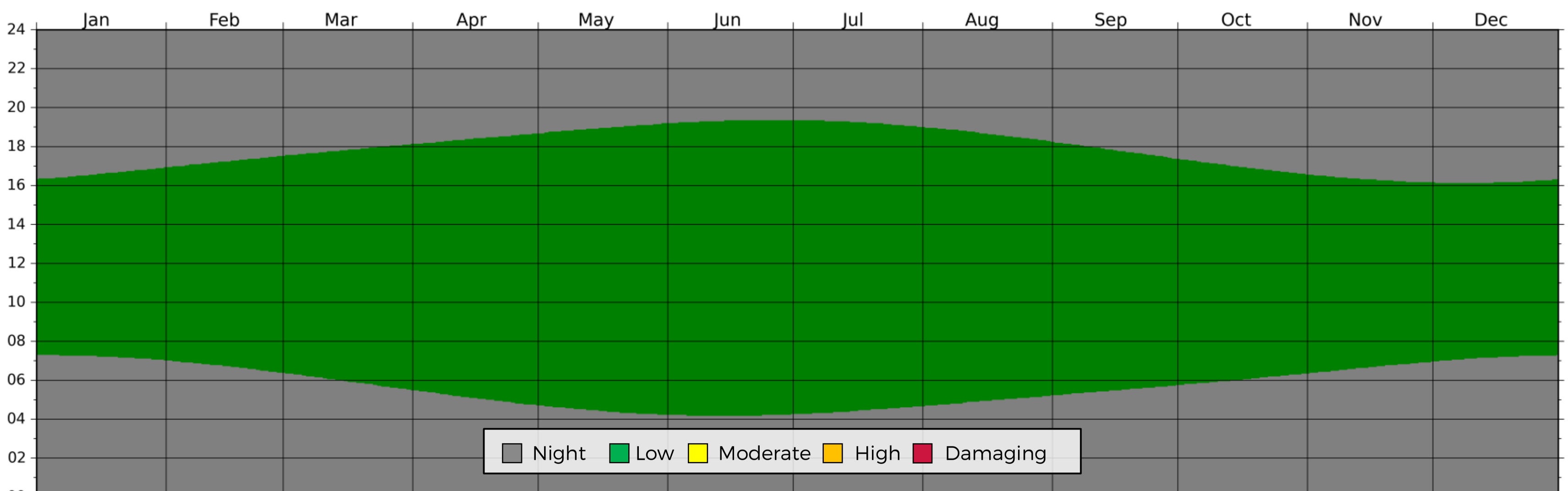


Pedestrian Receptors P15-P17

Receptors P15-P17 were chosen to assess the visual impact associated with solar reflections at Fenway Park.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

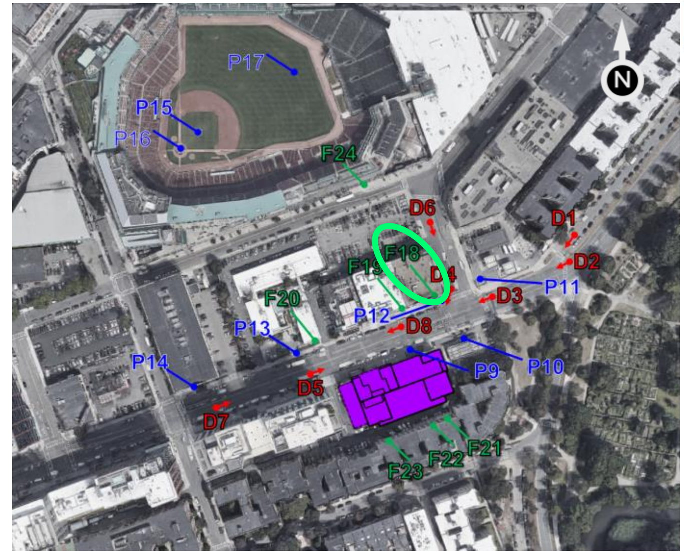


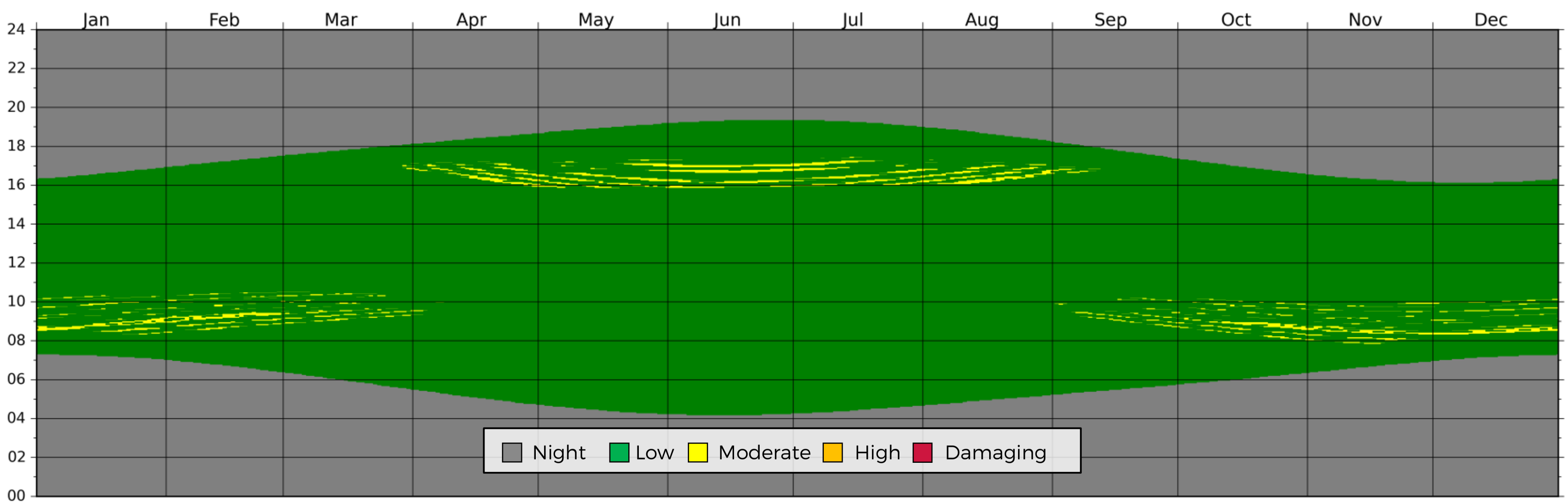


Facade Receptor F18

Receptor F18 was chosen to assess the visual impact associated with solar reflections reaching the southern facade of 1249 Boylston St. at approximately 2nd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

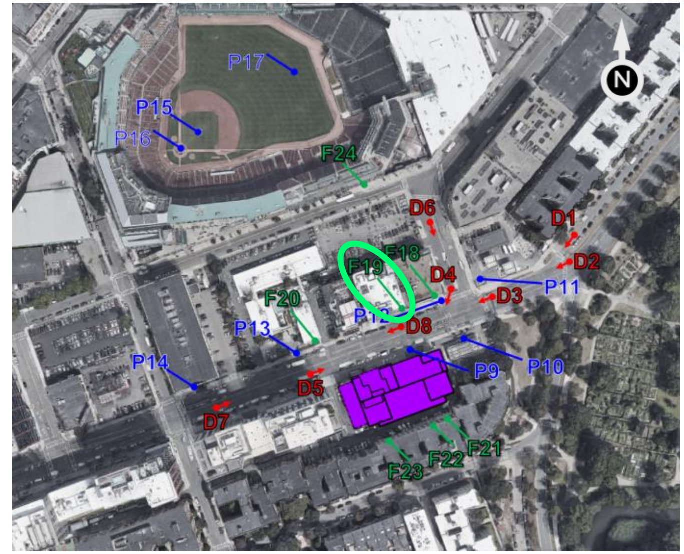


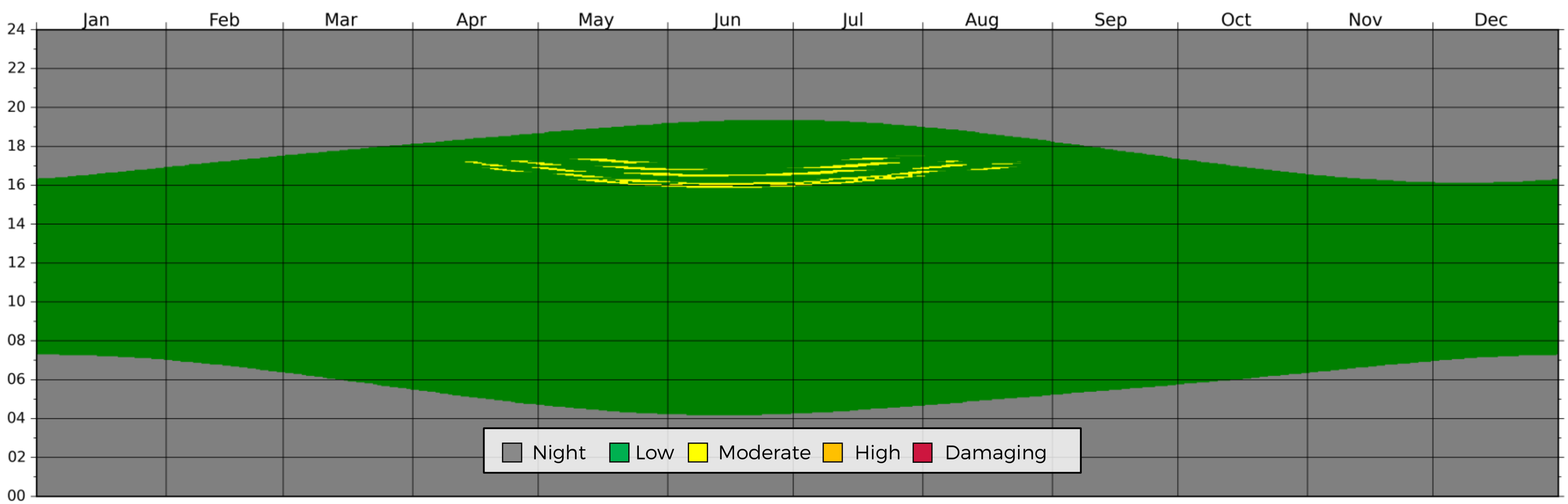


Facade Receptor F19

Receptor F19 was chosen to assess the visual impact associated with solar reflections reaching the southern facade of 1255 Boylston St. at approximately 2nd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



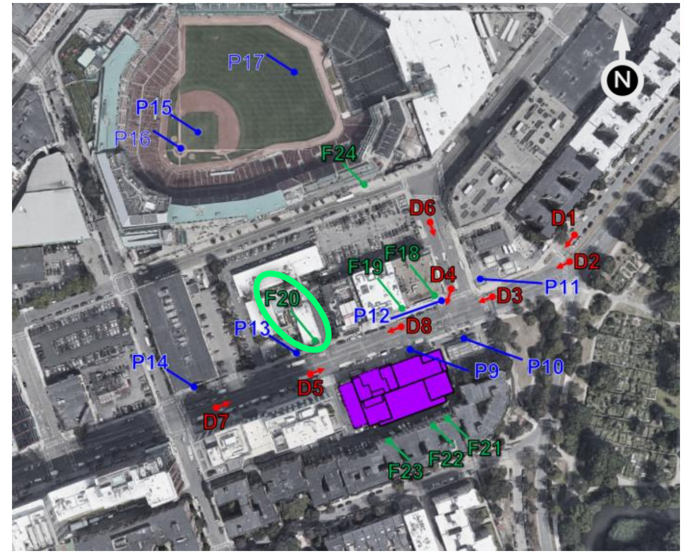


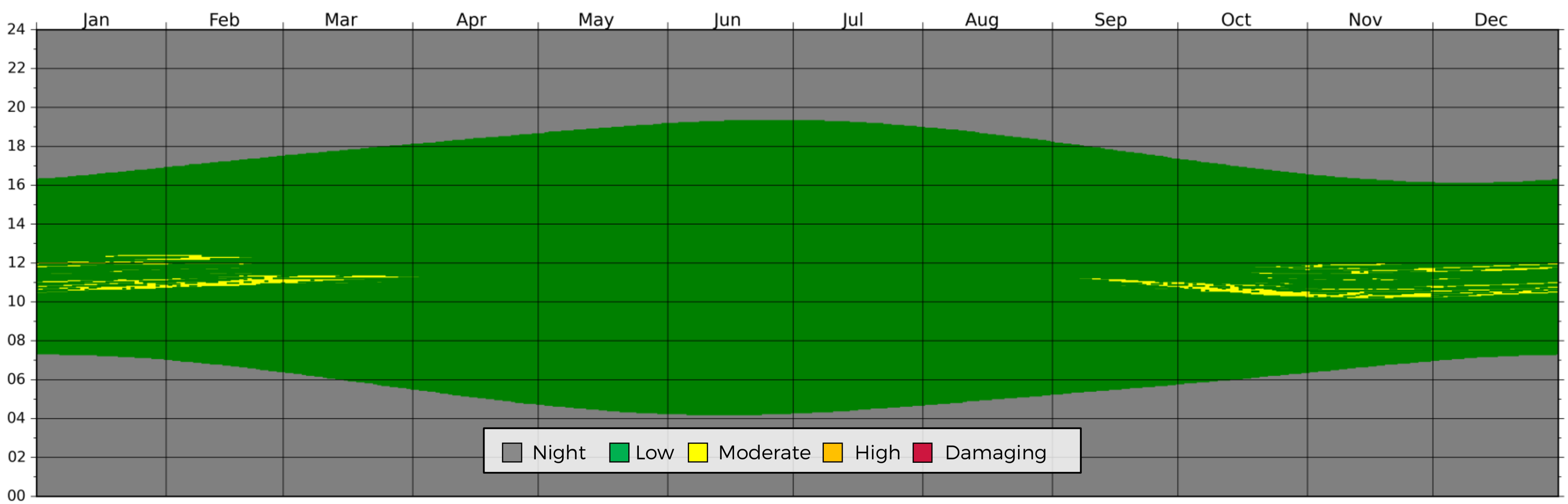
ANNUAL VISUAL IMPACT

Facade Receptor F20

Receptor F20 was chosen to assess the visual impact associated with solar reflections reaching the southern facade of 1271 Boylston St. at approximately 2nd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

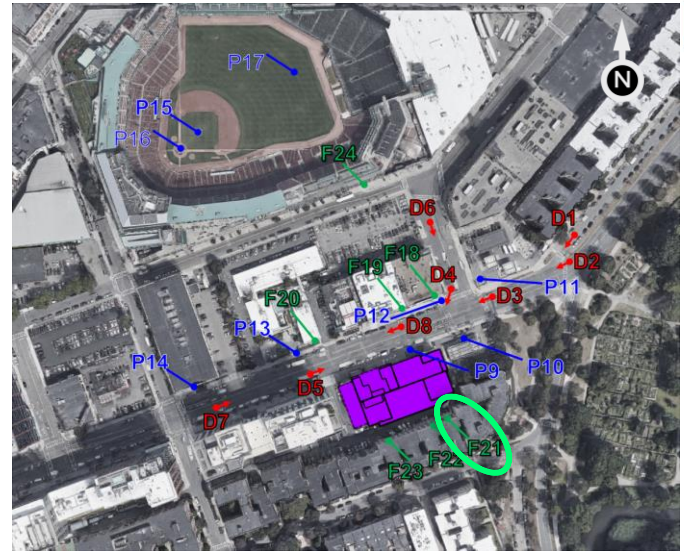


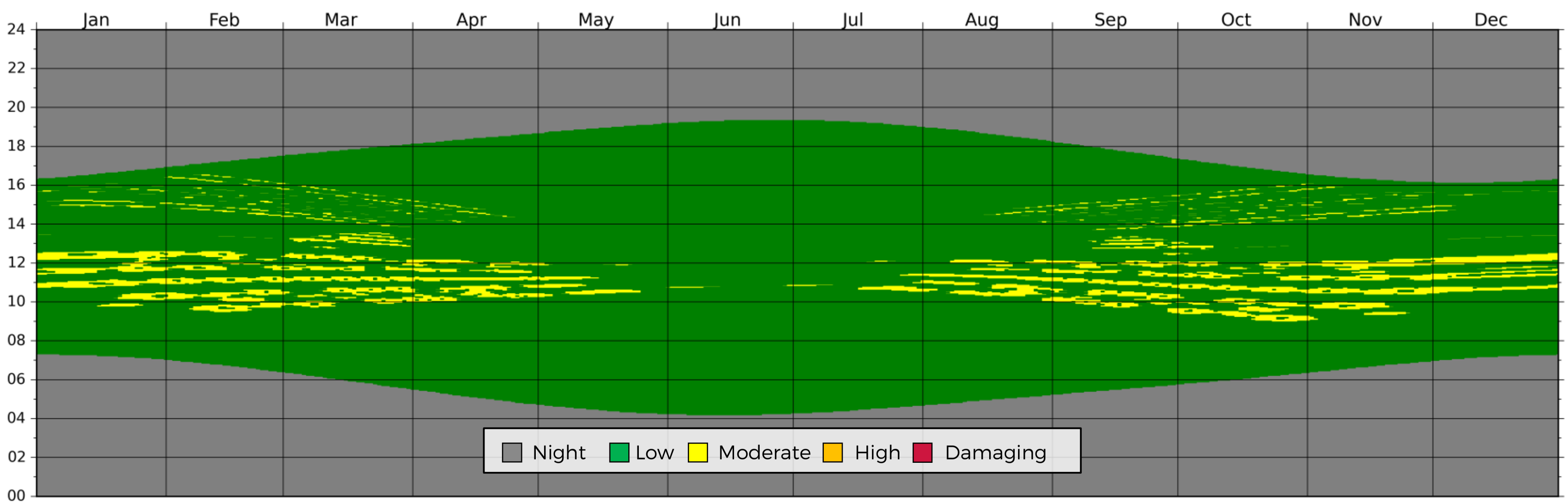


Facade Receptor F21

Receptor F21 was chosen to assess the visual impact associated with solar reflections reaching the northern (rear) facade of 1 Peterborough St. at approximately 3rd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

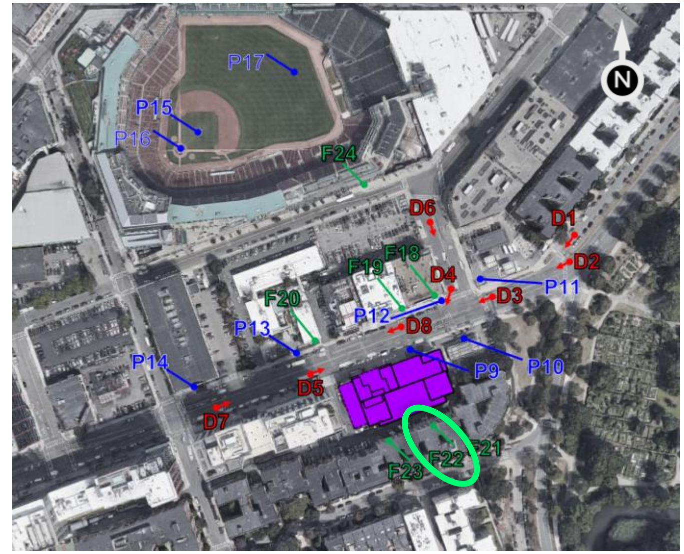


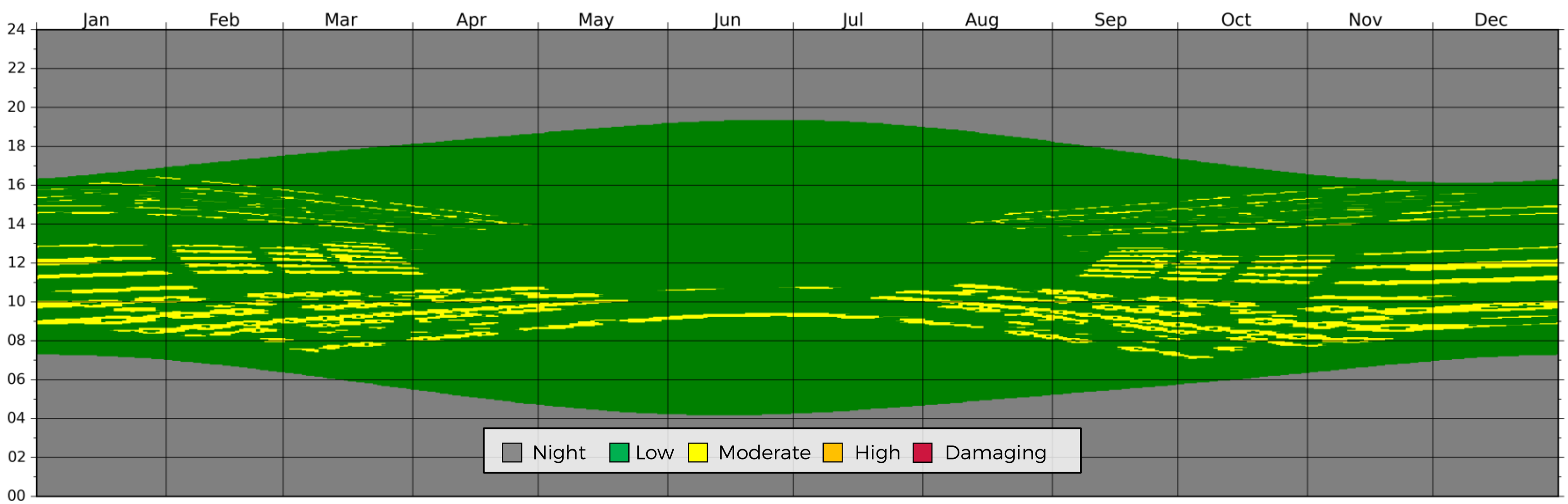


Facade Receptor F22

Receptor F22 was chosen to assess the visual impact associated with solar reflections reaching the northern (rear) facade of 5 Peterborough St. at approximately 4th floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

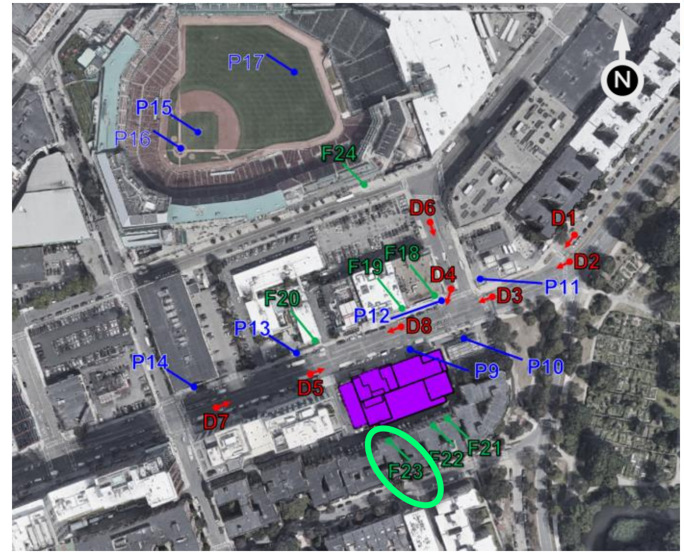


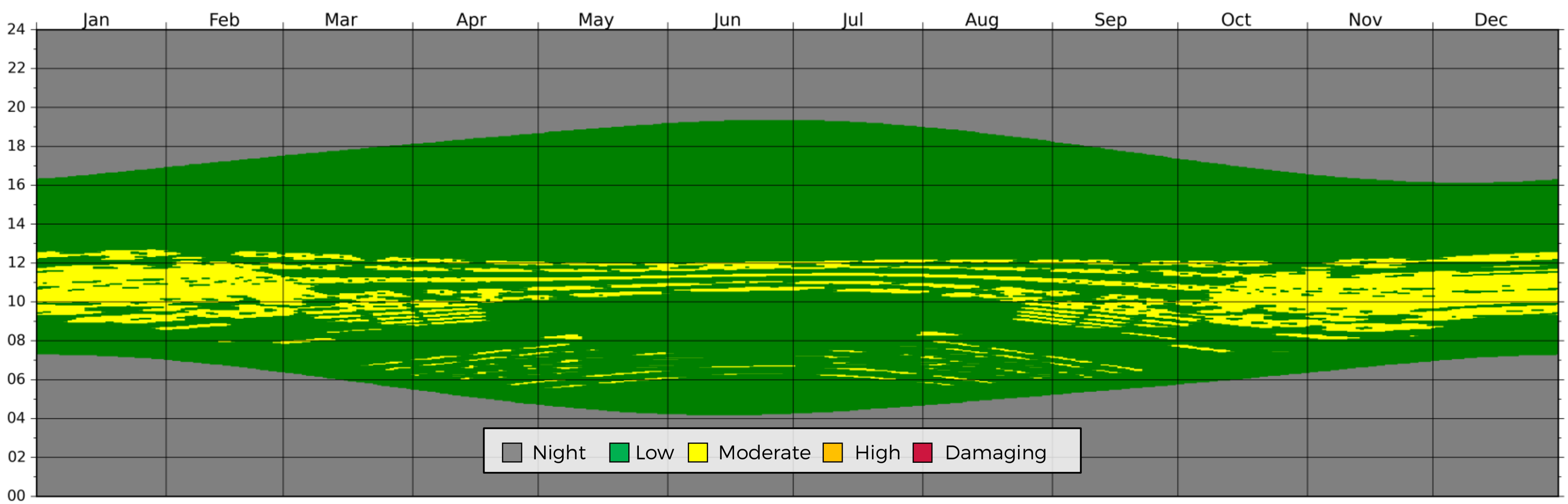


Facade Receptor F23

Receptor F23 was chosen to assess the visual impact associated with solar reflections reaching the northern (rear) facade of 16 Peterborough St. at approximately 4th floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



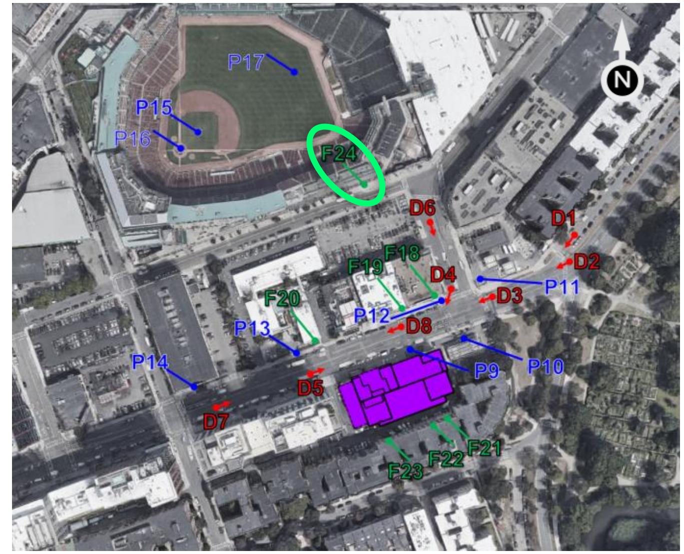


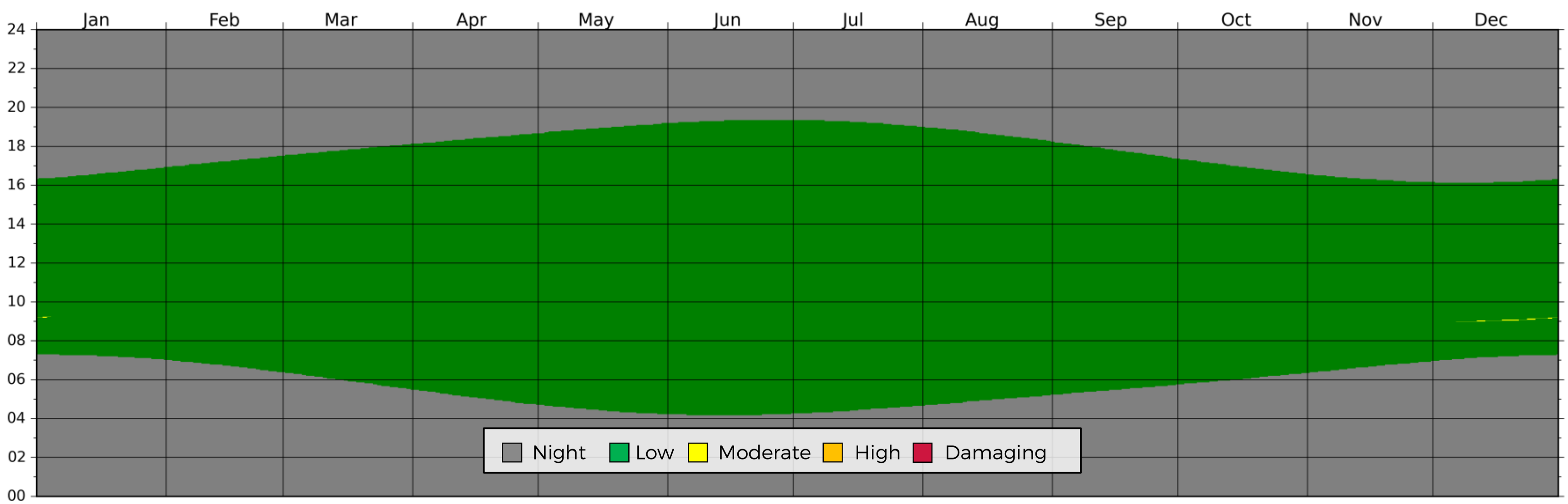
ANNUAL VISUAL IMPACT

Facade Receptor F24

Receptor F24 was chosen to assess the visual impact associated with solar reflections reaching the southern facade of Fenway Park at 10 Van Ness St. at approximately 3rd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



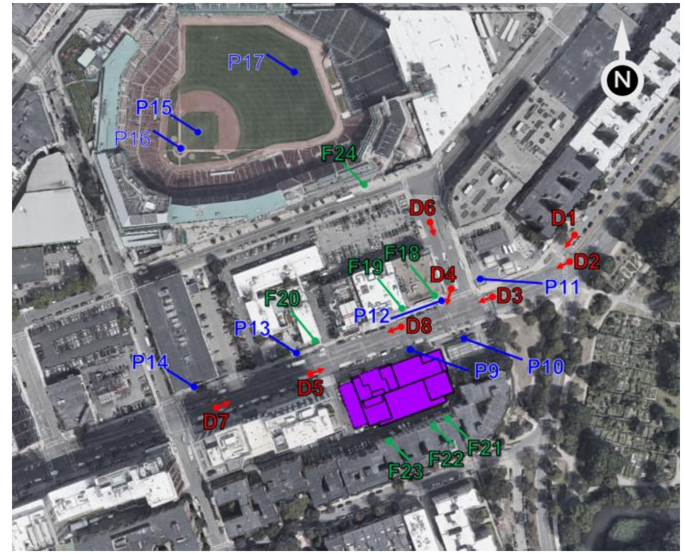


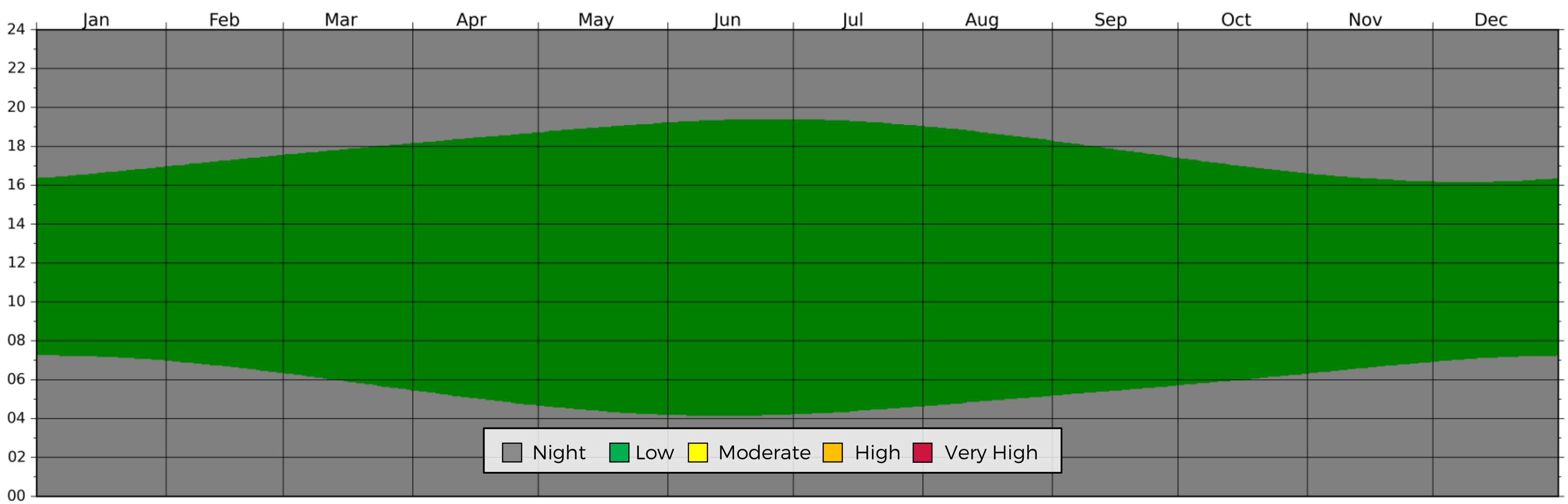
ANNUAL THERMAL IMPACT - PEOPLE

All Receptors

All reflection impacts at all receptors were found to have intensities below RWDI's short-term and human safety threshold values.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



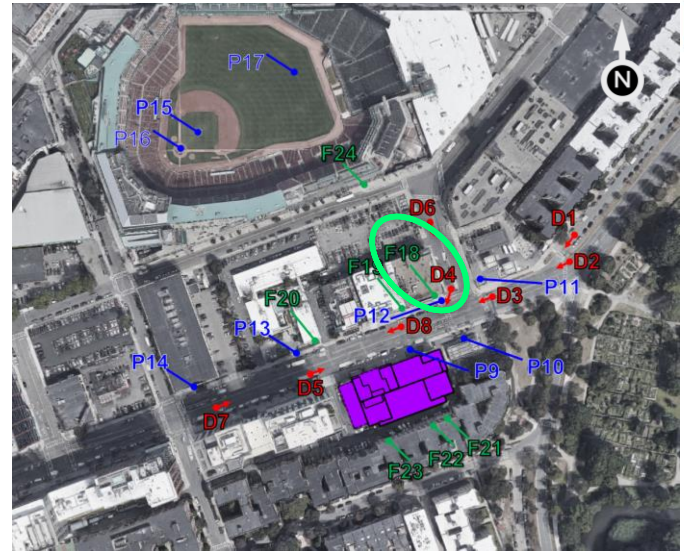


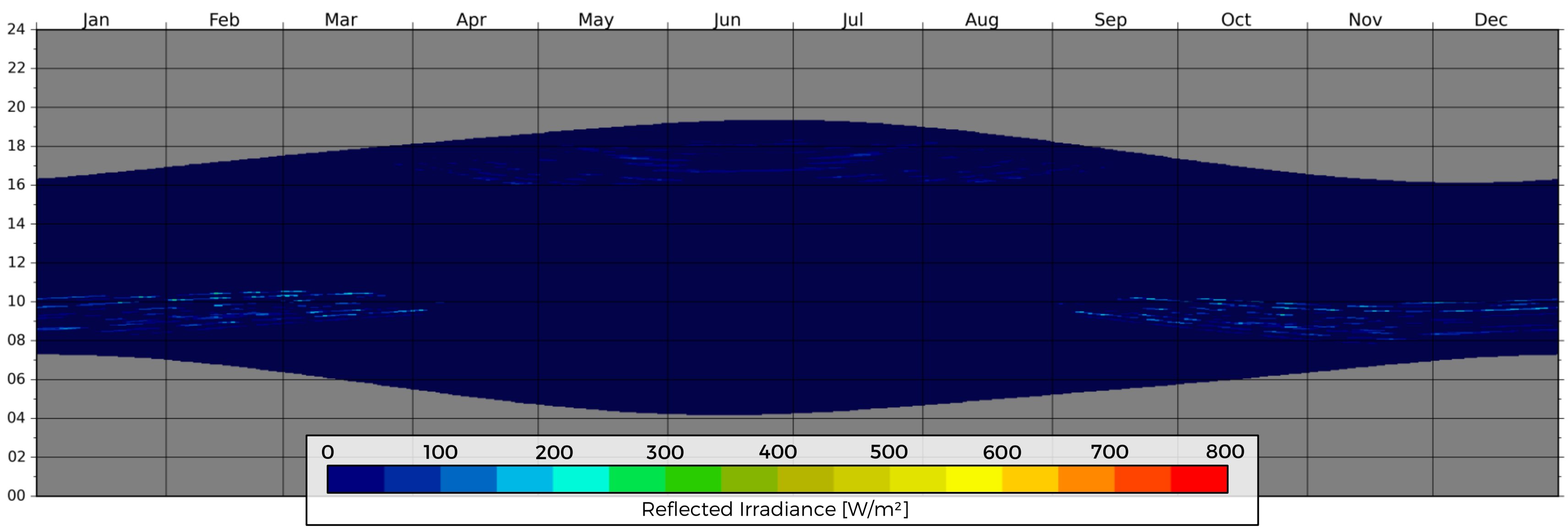
ANNUAL THERMAL IMPACT - FACADE

Facade Receptor F18

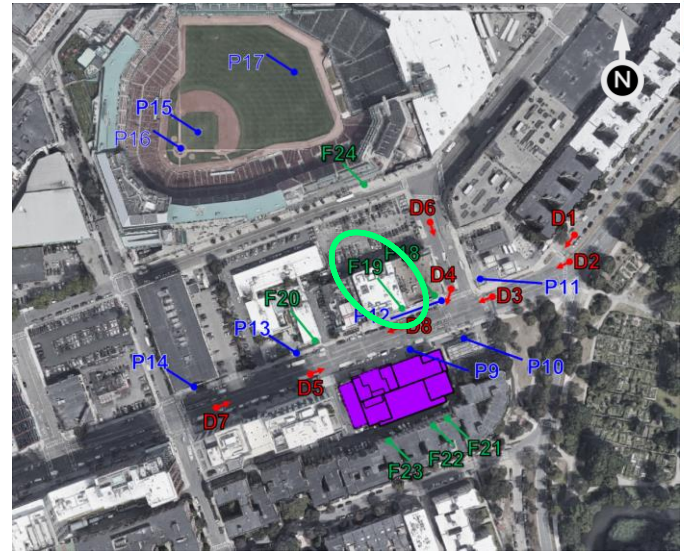
Receptor F18 was chosen to assess the thermal impact associated with solar reflections reaching the facade of 1249 Boylston St. at approximately 2nd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.





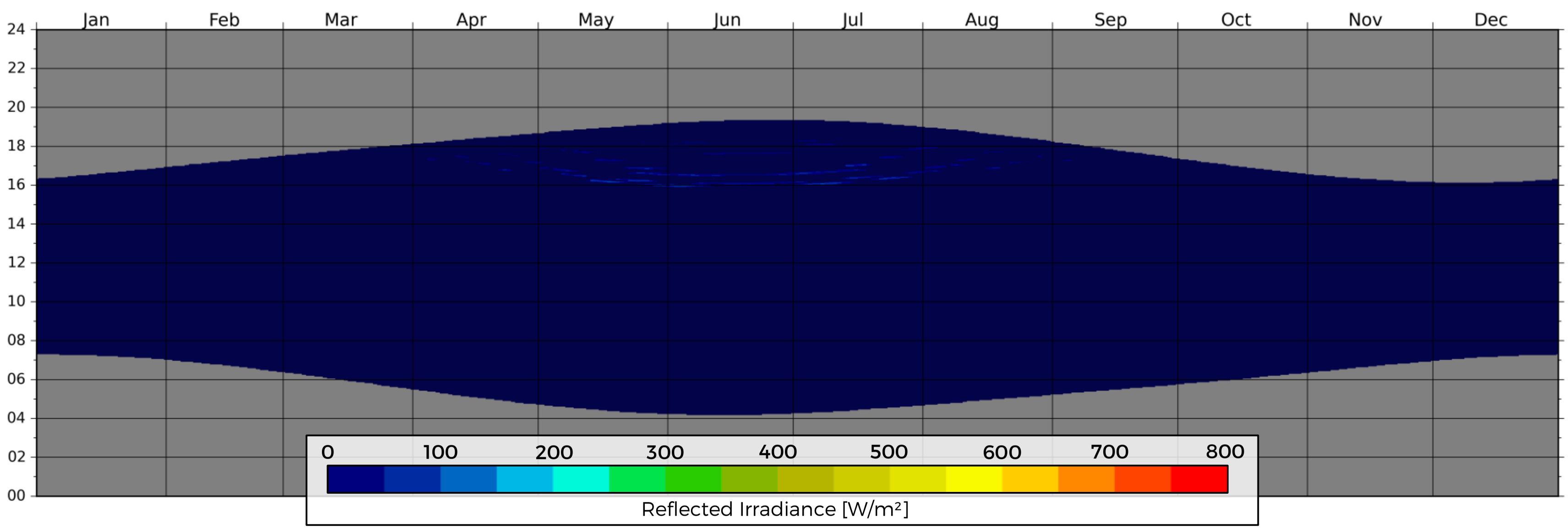
ANNUAL THERMAL IMPACT - FACADE



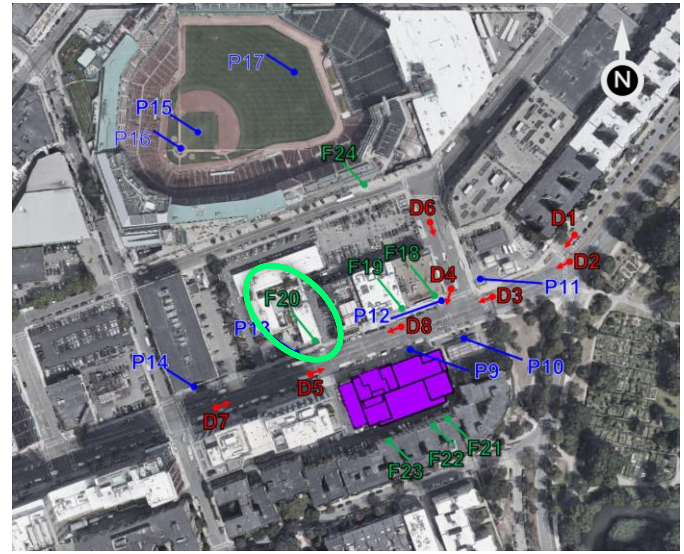
Facade Receptor F19

Receptor F19 was chosen to assess the thermal impact associated with solar reflections reaching the facade of 1255 Boylston St. at approximately 2nd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



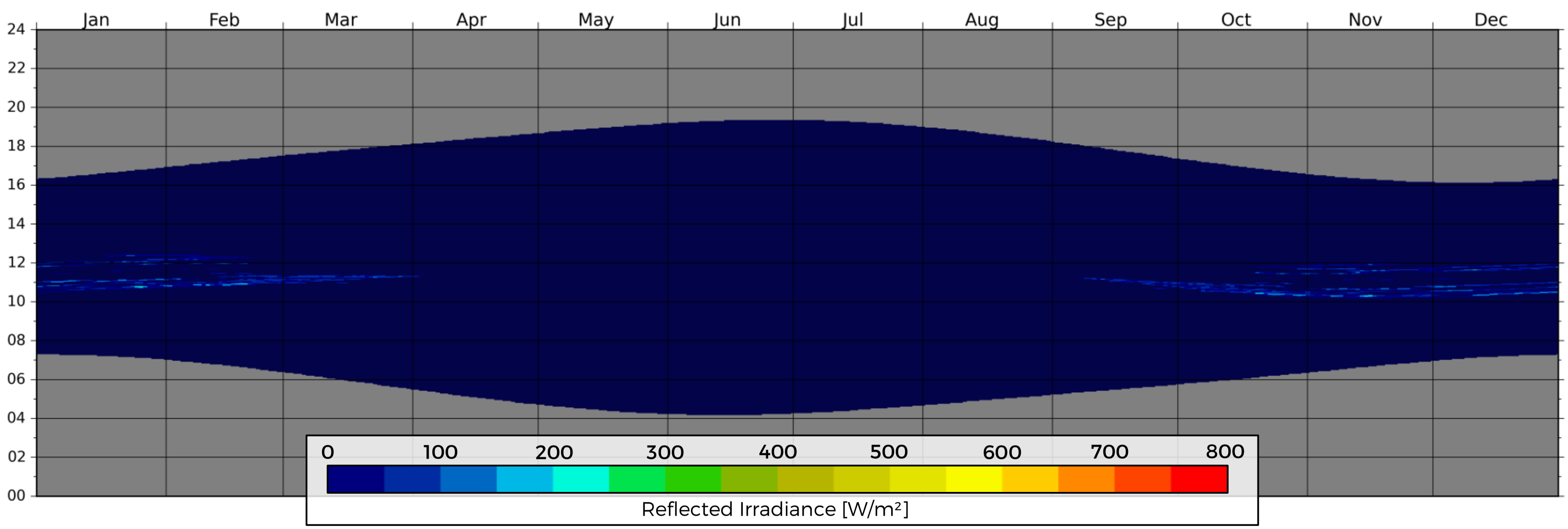
ANNUAL THERMAL IMPACT - FACADE



Facade Receptor F20

Receptor F20 was chosen to assess the thermal impact associated with solar reflections reaching the facade of 1271 Boylston St. at approximately 2nd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

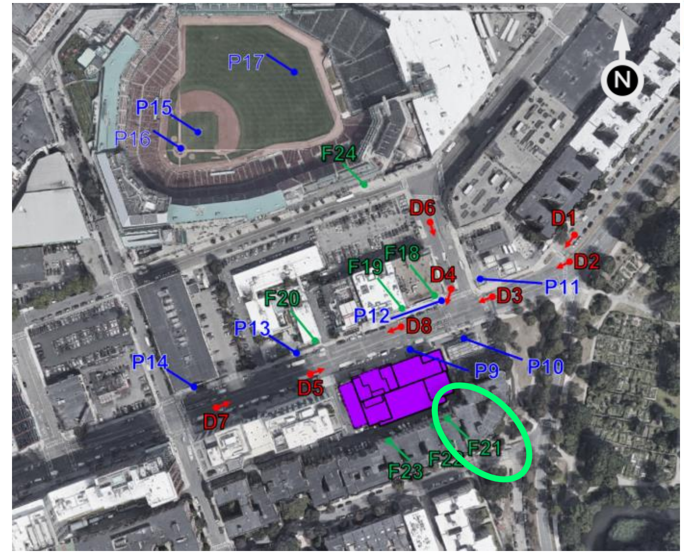


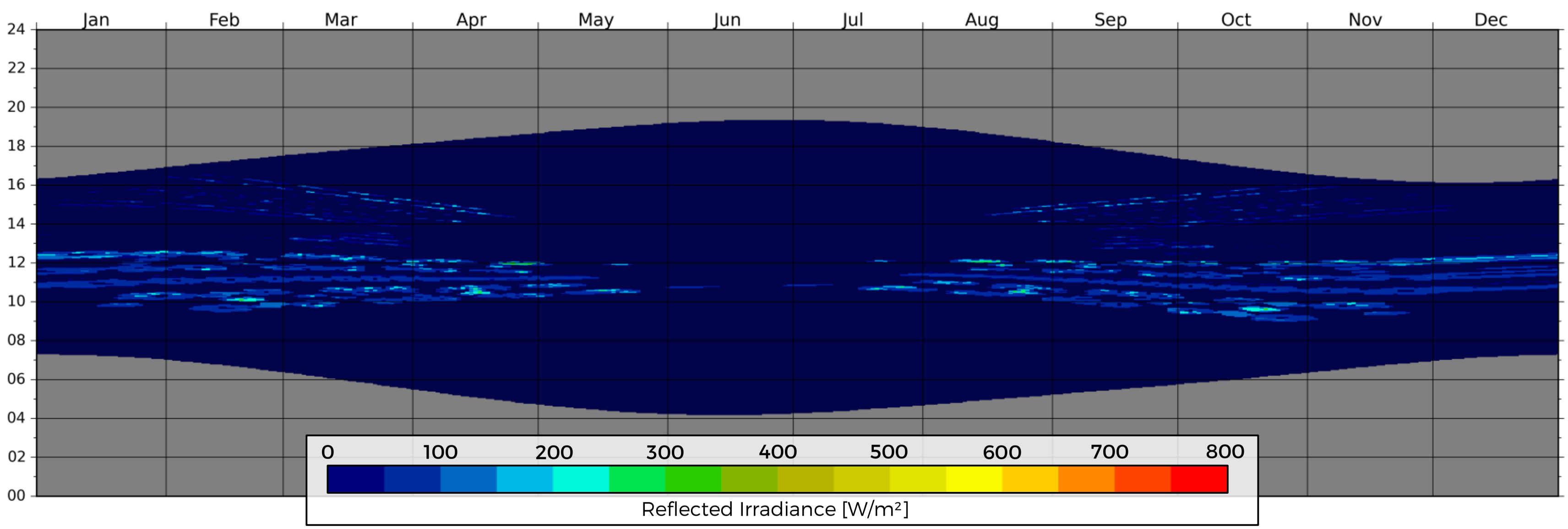
ANNUAL THERMAL IMPACT - FACADE

Facade Receptor F21

Receptor F21 was chosen to assess the thermal impact associated with solar reflections reaching the facade of 1 Peterborough St. at approximately 3rd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



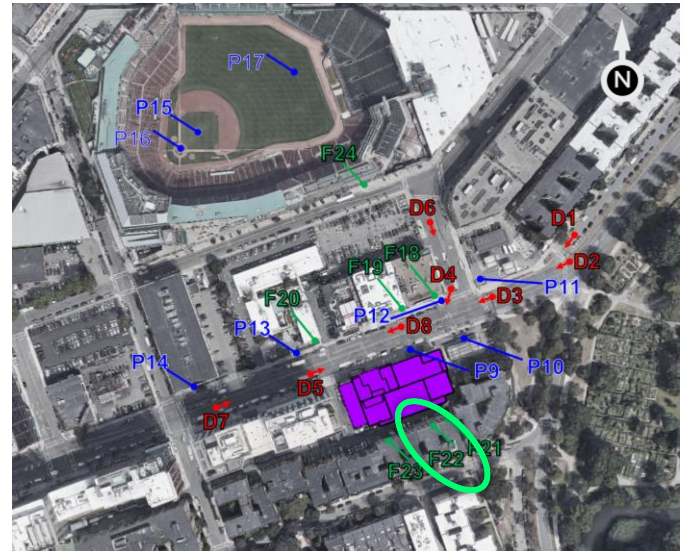


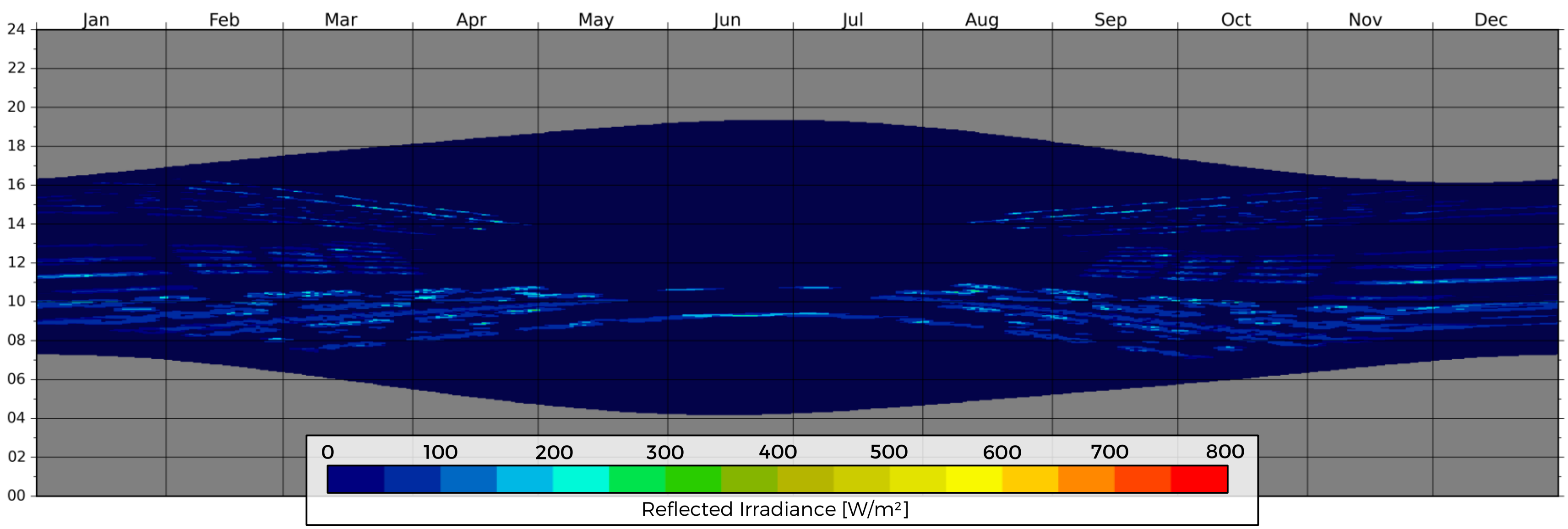
ANNUAL THERMAL IMPACT - FACADE

Facade Receptor F22

Receptor F22 was chosen to assess the thermal impact associated with solar reflections reaching the facade of 5 Peterborough St. at approximately 4th floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



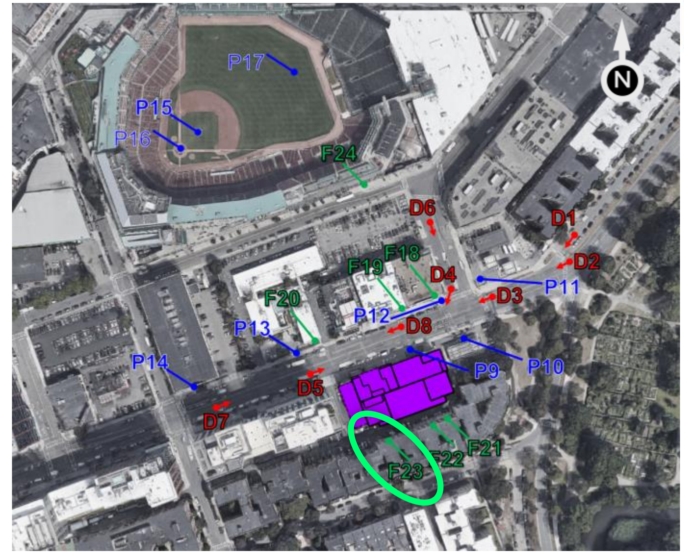


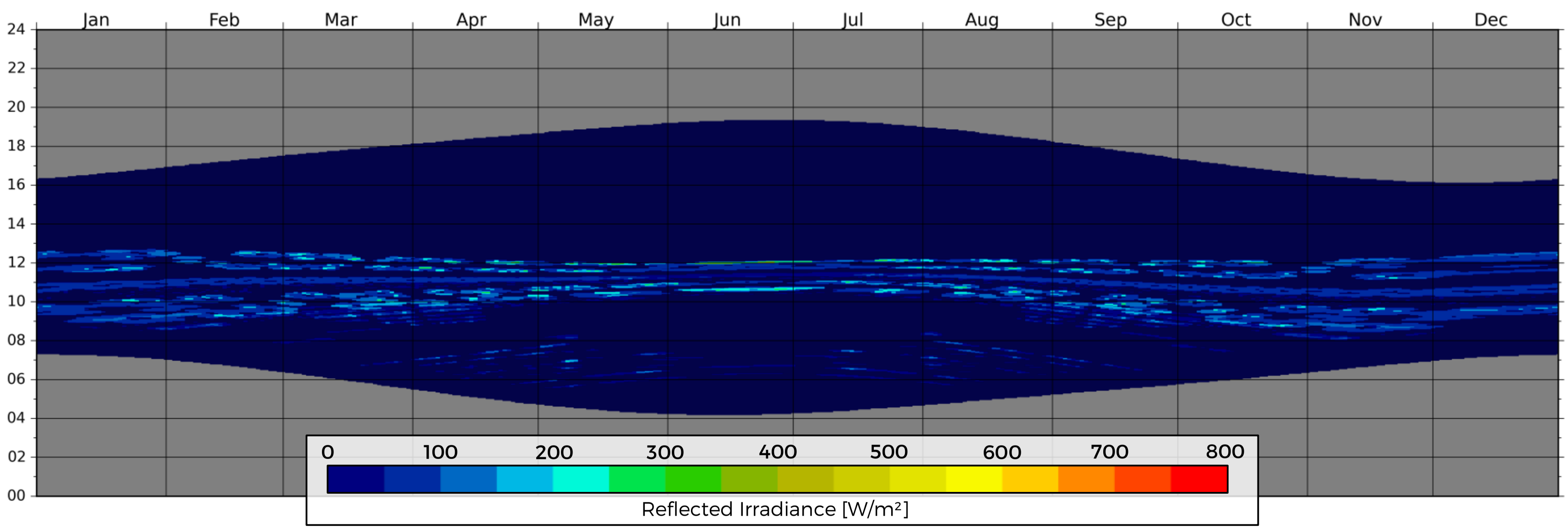
ANNUAL THERMAL IMPACT - FACADE

Facade Receptor F23

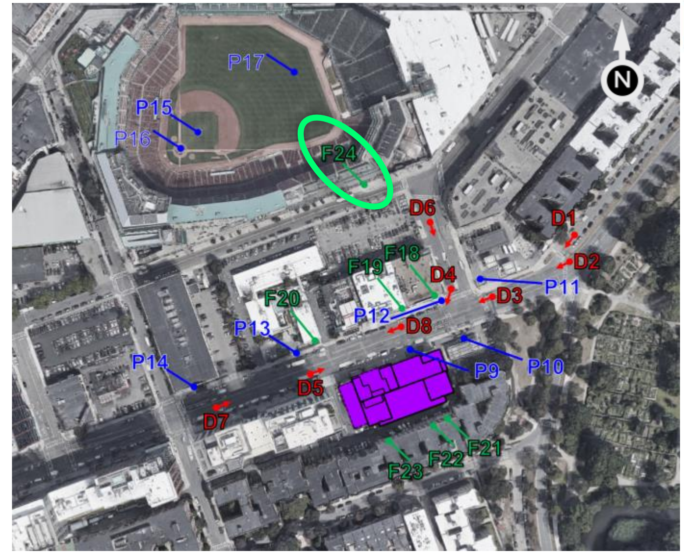
Receptor F23 was chosen to assess the thermal impact associated with solar reflections reaching the facade of 16 Peterborough St. at approximately 4th floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.





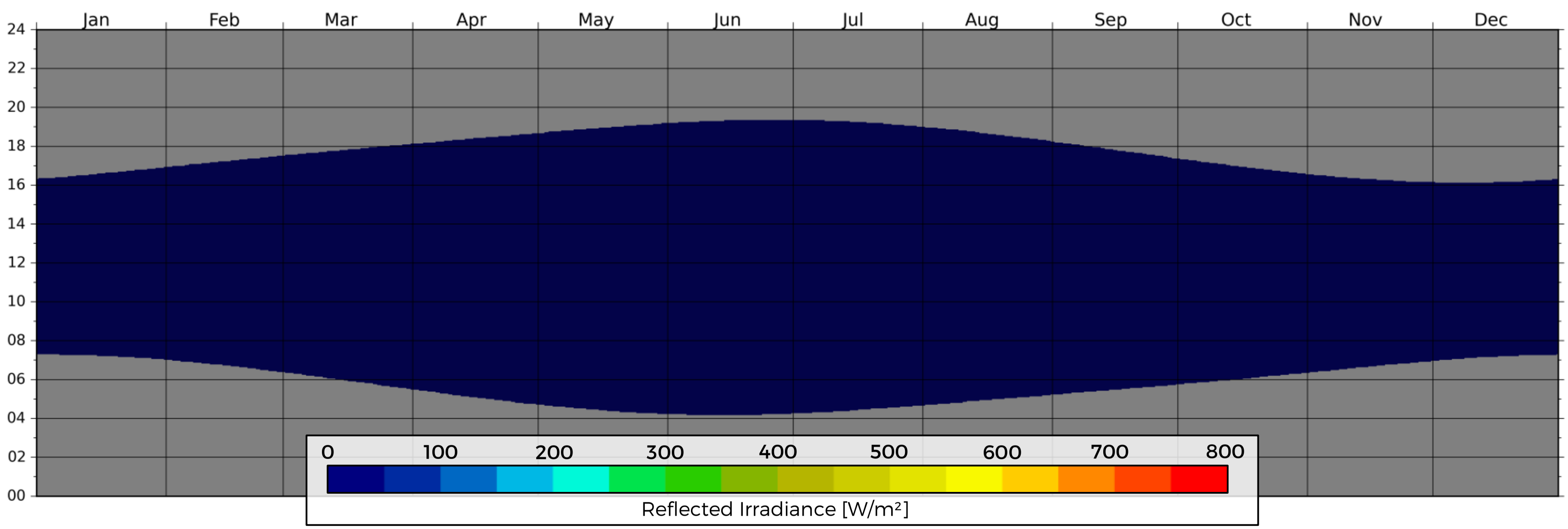
ANNUAL THERMAL IMPACT - FACADE



Facade Receptor F24

Receptor F24 was chosen to assess the thermal impact associated with solar reflections reaching the facade of Fenway Park at 10 Van Ness St. at approximately 3rd floor height.

Please note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.



APPENDIX B

RWDI REFLECTION CRITERIA

Visual Glare

There are currently no criteria or standards that define an "acceptable" level of reflected solar radiation from buildings. RWDI has conducted a literature review of available scientific sources[1] to determine levels of solar radiation that could be considered acceptable to individuals from a visual standpoint.

Many glare metrics are designed for interior use and have been found to not correlate well with the glare impact humans perceive from direct sun or in outdoor environments. RWDI uses the methodology of Ho et al[2], which defines glare impact based on a physical reaction rather than on a preference based correlation.

Based on the intensity of the glare source and the size of the source in the field of view (Figure B1), the risk of that source causing temporary flash blindness (i.e. the after images visible after one is exposed to a camera flash in a dark room) faster than a person can reflexively close their eyes can be determined.

If this 'after-imaging' can occur faster than the human blink reflex, it presents an unavoidable effect on a person based on physiology rather than preference. This forms the basis of how we determine if a reflection is 'significant'.

This methodology has also been adopted by the United States Federal Aviation Administration (FAA) for determining the risk of glare to pilots and other airport staff under FAA Interim Policy 78 FR 63276.

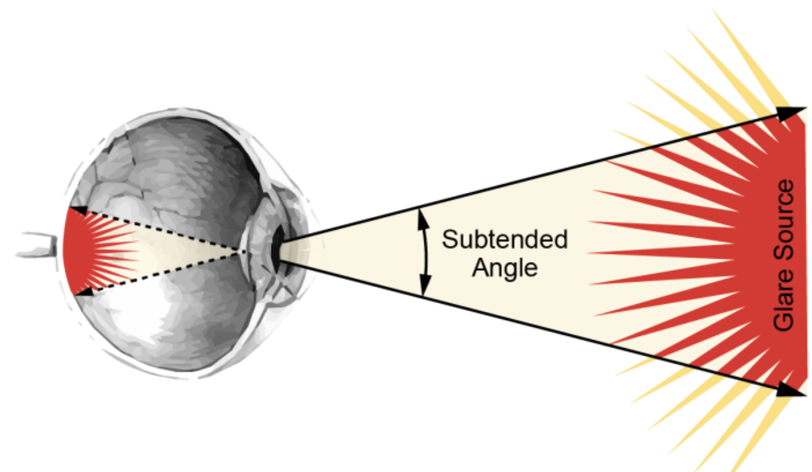


Figure B1: Schematic Illustrating the Subtended Angle of a Glare Source

Visual Glare (cont'd)

At the screening level, we conservatively take any reflections at least 50% of the intensity required to cause after-images as a "significant" reflection to be counted in the frequency analysis. In the detailed phase of work, we use the typical threshold level.

As a reference, point 1 on Figure B2 illustrates where looking directly at the sun falls in terms of irradiance on the retina (the back of the eye) and the size of the angle that the sun subtends in the sky. This puts it just at the border of causing serious damage before the blink reflex can close the eye.

The other points in Figure B2 correspond to the following:

2. Direct viewing of high-intensity car headlamp from 50 feet / 15 m
3. Direct viewing of typical camera flash from 7 feet / 2 m
4. Direct viewing of high-intensity car headlamp from 5 feet / 1.5 m
5. Direct viewing of frosted 60W light bulb from 5 feet / 1.5 m
6. Direct viewing of average computer monitor from 2 feet / 0.6 m

Note that the retinal irradiances described on this page are significantly higher than the irradiance levels discussed elsewhere in this report. This is because the human eye focuses the energy on to the retina. The magnitude of the increase is dependent on the geometry of the human eye and the source of the glare, both of which are computed per the Ho et al methodology.

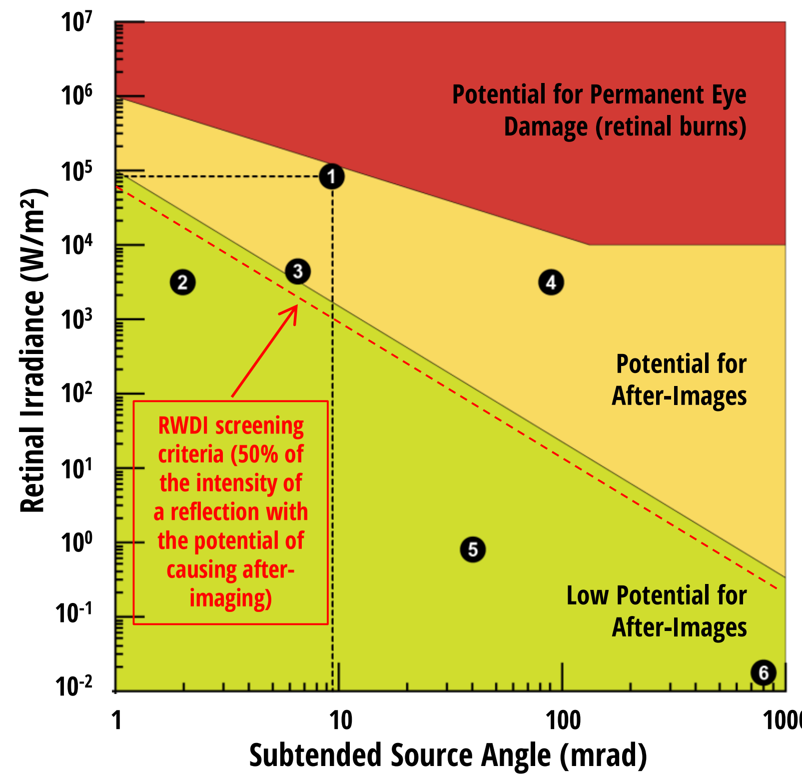


Figure B2: After-Imaging Potential From Various Glare Sources

Visual Glare (cont'd)

Significant glare impacts on the operators of vehicles or heavy equipment pose a particular risk to public safety due to operator distraction or reduction in their visual acuity. Thus, in the detailed analysis, RWDI assigns an assumed view direction to those engaged in "high-risk" activities (e.g. driving a car or flying a plane) as well as an assumed field of view.

The assigned directions and fields of view acknowledge that an operator is particularly sensitive to reflections emanating from the direction in which they are travelling (and therefore cannot safely look away from) and also that the opaque elements of the vehicle will act to obstruct reflections beyond a given angle.

For drivers the critical angle is taken to be 20° away from the direction of view[3]. Thus, any reflections emanating from within this 20° field of view are considered 'high' impacts, whereas reflections emanating from outside this cone are classified as 'moderate' impacts. This angle is adjusted as needed for impacts on other vehicles such as aircraft[4], trains[5], and other heavy equipment[6].

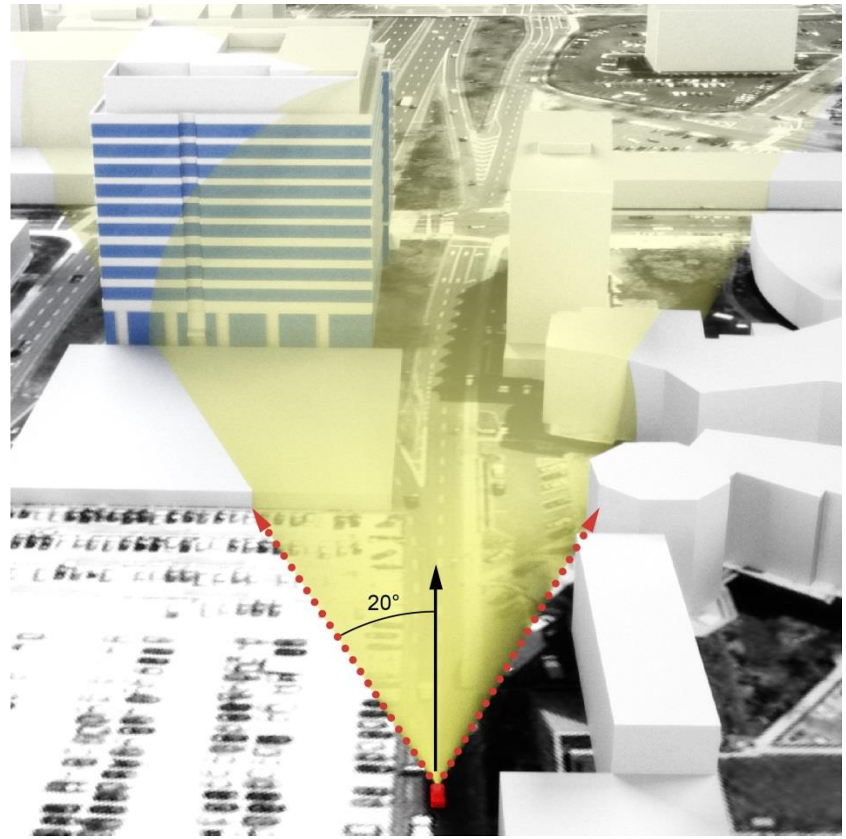


Figure B3: Illustration of a Driver's 20° Field of View

Thermal Impact (Heat Gain) on People

The primary sources for exposure limits to thermal radiation come from fire protection literature. The U.S. National Fire Protection Association (NFPA) defines 2,500 W/m^2 as an upper limit for a tenable egress environment[7]. That being said, while an individual could move through such an environment, they would not necessarily emerge unscathed. Both the British Standards Institution[8] and the U.S. Federal Energy Management Agency[9] indicate that individuals are likely to feel pain within 30 seconds at such exposure levels on bare skin. With second degree burns possible within minutes of exposure. Additionally, this level of additional heat flux can lead to rapid heating of exposed objects which could present a further risk to human safety.

It should be noted that these numbers are guideline values only, and that in reality many factors (skin color, age, clothing choice, etc.) influence how a person reacts to thermal radiation. **For our work RWDI has established 2,500 W/m^2 as a ceiling exposure limit which reflection intensity should not exceed for any length of time.**

Lower reflection intensities, while not posing as serious of a risk to human safety, can still negatively impact human comfort. There are no definitive guidelines or criteria with respect to this issue. We know this criterion should be less than 2,500 W/m^2 and greater than typical peak solar noon levels of 1,000 W/m^2 which people commonly experience. RWDI's opinion at this time is that a reasonable criterion is to limit reflected irradiance exposure to 1,500 W/m^2 or less. Based on our assessment, we believe at this level of irradiance most people would be able to tolerate it for several minutes before the onset of discomfort. Additionally reflections at this intensity level will heat surfaces more slowly.

Thus we feel reflections below 1,500 W/m^2 pose a reduced risk to people and should therefore be considered a short term exposure limit. We would conservatively define "short term" as 10 minutes or less which is slightly shorter than the standard 15 minute definition of short term used in the occupational safety context.

Thermal Impact (Heat Gain) on Property

The impact of solar irradiance on different materials is primarily based on the temperature gains to the material which can cause softening, deformation, melting, or in extreme cases, combustion. These temperature gains are difficult to predict as they are highly dependent on the convective heat transfer from air movement around the object and long-wave radiative heat transfer to the surroundings.

Generally, irradiance levels at or above 10,000 W/m^2 for more than 10 minutes are required to ignite common building and automotive materials in the presence of a pilot flame. That value increases to 25,000 W/m^2 when no pilot flame is present[10,11,12]. However, some materials like plastics and even some asphalts may begin to soften and deform at lower temperatures. For example, some plastics can deform at a temperature of 140°F (60°C), or lower if force is applied. The applied force typically comes from the thermal expansion of the material, the force of gravity acting on the material or an external mechanical force (i.e. someone or something pushing or pulling on it).

Aside from the risk of damage to the material itself, a hot surface poses a safety risk to any person who may come into contact with it. This is particularly important in an urban context as the individual may not expect the object to be heated. NASA[13] defines an upper limit of 111°F (44°C) for surfaces that require extended contact time with bare skin. Surface temperatures below this limit can be handled for any length of time without causing pain.

Because of the difficult nature of determining material temperatures, RWDI takes a conservative approach and uses a **threshold value of 1,000 W/m^2 which is approximately the peak intensity of natural sunlight that could be expected to occur over the course of a year**. Intensities beyond this value exceed the levels of irradiance that common exterior building materials are presumably designed for, and depending on the duration, may lead to deformation or damage. Though, as noted this would depend heavily on environmental conditions and the material properties of the exposed object or assembly.

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