The Residences at Forest Hills

Jamaica Plain, Massachusetts

Project Notification Form

October 20, 2016

submitted to the **Boston Planning and Development Agency**
submitted by **Criterion Development Partners**

prepared by **Fort Point Associates, Inc.**

in association with
ICON Architecture
Copley Wolff Design Group
Nitsch Engineering
MDM Transportation
Rubin & Rudman
Mintz Development Group

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Urban Planning Environmental Consulting Project Permitting

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PROJECT SUMMARY

CHAPTER 1: PROJECT SUMMARY

1.1 PROJECT IDENTIFICATION

Project Name: The Residences at Forest Hills, Jamaica Plain

Address/Location: Washington Street

Assessor's Parcel Numbers: 1103720010, 1103719000, 1103718000

1.2 PROJECT SITE

Criterion Development Partners (the "Proponent") proposes to construct a mixed-use, transit-oriented development called The Residences at Forest Hills (the "Project") on a lot currently in use as a paid surface parking lot located directly across the street from the Forest Hills MBTA Station. It is comprised of three parcels totaling approximately 91,730 square feet (sf) or 2.2 acres (the "Project Site"). There are no existing buildings on the Project Site.

The Project Site is roughly bounded by the Arborway and the MBTA Arborway Yard to the north, the Forest Hills MBTA Station to the west, a residential neighborhood consisting mainly of triple deckers to the south, and a smaller residential neighborhood consisting of single family homes, condominiums, two churches, and the West Roxbury Municipal Court to the east.

The Project Site is bisected by the Stony Brook Conduit, owned by the Boston Water and Sewer Commission, running underground generally in a north/south direction.

See Figure 1-1, Locus Map, and Figure 1-2 Aerial View of Existing Site.

1.3 PROJECT SUMMARY

The Proponent proposes to redevelop the Project Site into a mixed-use commercial and residential development, creating approximately 5,500 sf of street front retail and restaurant space, approximately 252 housing units including 50 affordable units, and associated structured parking.

The Project will enhance the urban context of the Project Site by creating active ground floor retail uses which, together with the existing single-story commercial buildings along Washington Street, will complete the street wall along the Project Site's western edge. The Project will provide, pedestrian-oriented publicly-accessible open spaces including an open lawn to the south, and streetscape enhancements such as street trees, seating, and lighting.

The proposed design is composed of three main buildings. The building fronting Washington Street will provide five stories of residential units over ground floor retail space. The two buildings internal to the Project Site will provide 6 stories of residential units with one building tapering to 5 stories where it is closest to Tower Street and Orchardhill Road.

The Project will incorporate multiple green building measures and will be Leadership in Energy and Environmental Design (LEED) certifiable as required by Article 37 of the City of Boston Zoning Code with a minimum goal of LEED Silver certification. The full scope of sustainability strategies is discussed in more detail in Chapter 4, Sustainability.

Approximately 130 parking spaces will be provided in a lower level parking garage. The new internal roadway will provide 10 surface parking spaces for visitors making short visits to the Project. There will be a total of approximately 140 parking spaces provided for the Project with a parking ratio of approximately 0.56. Vehicular access to the Project Site and parking garage will be provided from Washington Street.

The Project will enhance pedestrian access to the Project Site by providing pathways through the property and improving the extremely close connection to Forest Hills Station. The Project will enhance bicycle connectivity by providing a connection to the popular bicycle commuting route of Southwest Corridor Park, which runs to the Back Bay in downtown Boston, and terminates just northwest of the Project Site. See Figure 1-3, Project Site Plan.

1.4 COMMUNITY PROCESS

The Proponent has placed community outreach and responsiveness at the forefront of its efforts to redevelop the Project Site, including modifying the initial design and development program in response to community input. The Project as originally proposed in the Letter of Intent (LOI) contemplated 260 residential units with the long building edges facing the easterly property line and a service area and a garage entry located on Orchardhill Road. Based on input from the community, the Proponent modified the design by changing the shape of the buildings to pull the massing away from the easterly property line, relocating the service area and garage entry internal to the site, and increasing the buffers between the new buildings and the residential neighbors. As a result of these changes, a number of units were lost and the Project now consists of 252 units.

The Proponent is committed to continuing community engagement throughout the City of Boston review process. The Proponent is making a long-term investment in the neighborhood and endeavors to build a development that respects its neighbors, increases public amenities, and adds new economic activity to the City of Boston.

In addition to walking the neighborhood and talking to residents, the Proponent sent an informational Letter of Introduction about the Project and received approximately a dozen responses from community members. The Project Team responded to every comment and

question, and has met formally and informally with the following neighborhood/community groups and Project abutters in order to engage the community in the planning process.

- West Roxbury Courthouse Neighborhood Association, March 9, 2016
- Letter of Introduction, 230 letters sent in April 2016
- Owners of Brady Fallon Funeral Home at 10 Tower Street, April 2016
- Resident and trustee of Washingtonian Court Condominiums, May 2, 2016
- Washington Street Commercial Owners/Tenants, May 9, 2016
- 41 Orchardhill Road abutter, May 11, 2016
- Bremen Terrace and Orchardhill Road residents (approximately 14 attendees), June 2, 2016
- Postcard Mailing (re: filing of LOI and coUrbanize): 273 postcards sent August 2016
- Tower Street abutters (#10, 18, 20, 22), August 18, 2016
- Washingtonian Court Condominiums (eight residents), August 30, 2016

The Project Team has also discussed the Project with:

- Representatives from the Boston City Council
- Mayor Walsh's office
- The Boston Planning and Development Agency
- Other City of Boston Agencies/Departments
- State Legislators and State Agencies

In addition, The Proponent maintains a project page on the public website coUrbanize (courbanize.com/residences-forest-hills), which allows public access to current information about the Project and provides a forum for comment. This project page is currently live and has been visited by 584 people and garnered 36 "followers" and 22 commenters.

The early input gathered from the community and regulators has been incorporated in this Project Notification Form (PNF).

1.5 PUBLIC AND COMMUNITY BENEFITS

The Project will:

- Allow for construction of three new mixed-use residential buildings, which will accommodate new residents and provide relocation opportunities for existing residents of the Forest Hills area and add to the diversity of the housing stock through the creation of 252 new rental residential units;
- Create 50 units of affordable housing (20% of total units), 17 in excess of the City's December 2015 Inclusionary Development Policy
- Create a mix of units sizes and styles, including: studios; one-, two-, and three-bedroom units; three-bedroom townhouses; a Certified Artist live/work housing unit; and innovation units consisting of three bedrooms with private bathrooms and common living and dining space;
- Harmonize with the City's plans for the construction of new multifamily housing on Washington Street as outlined in the Forest Hills Improvement Plan;
- Improve the urban design characteristics of the area by constructing human-scaled buildings along Washington Street and transforming a parking lot to a vibrant mixed use;
- Enhance the pedestrian environment along Washington Street by improving aesthetics of the built environment and access to public open space;
- Add ground-floor commercial and retail space to activate the public realm and improve continuity of the Washington Street commercial streetwall;
- Facilitate Transit Oriented Development (TOD) by increasing residential density in proximity to the multi-modal Forest Hills Station and Southwest Corridor Park and by accommodating bicycle storage on-site;
- Provide Zipcar spaces and a bicycle-share facility serving residents and commuters;
- Provide on-site security;
- Support the City's goals for a sustainable future through the development of an energy-efficient and environmentally friendly building that will be certifiable, at a minimum, as LEED Silver;
- Provide improvements to the Project Site's stormwater run-off by replacing an impermeable parking lot;
- Increase property tax revenues to the City in excess of $500,000 per year;

- Provide approximately 200 construction-related jobs and 6-7 full-time equivalent permanent jobs in on-site property management, in addition to permanent retail jobs which will stimulate the local and regional economy.

1.6 SUMMARY OF ANTICIPATED PERMITS AND APPROVALS

The following table is a list of anticipated approvals for the Project.

Table 1-1: Anticipated Project Approvals

Agency	Approval
Local	
Boston Planning and Development Agency	• Article 80B Large Project Review • Cooperation Agreement • Boston Residents Construction Employment Plan • Affordable Housing Agreement
Boston Civic Design Commission	• Recommendation to the BRA/BPDA Board
Boston Zoning Board of Appeal	• Zoning Variances
Boston Transportation Department	• Transportation Access Plan Agreement • Construction Management Plan
Boston Water and Sewer Commission	• Site Plan Approval
Inspectional Services Department	• Building Permit • Certificate of Occupancy
Boston Parks Commission	• Approval for Work within 100 ft of Parkland
Boston Public Improvement Commission	• Site Plan Review
State	
Department of Conservation and Recreation	• Access Permit
Massachusetts Department of Environmental Protection	• Notification Prior to Construction or Demolition • Source Registration for Sewer Discharge • Source Regulation for Emergency Generator • Response Action Outcome Statement
Federal	
Environmental Protection Agency	• National Pollutant Discharge Elimination System Permit

1.7 PROJECT TEAM

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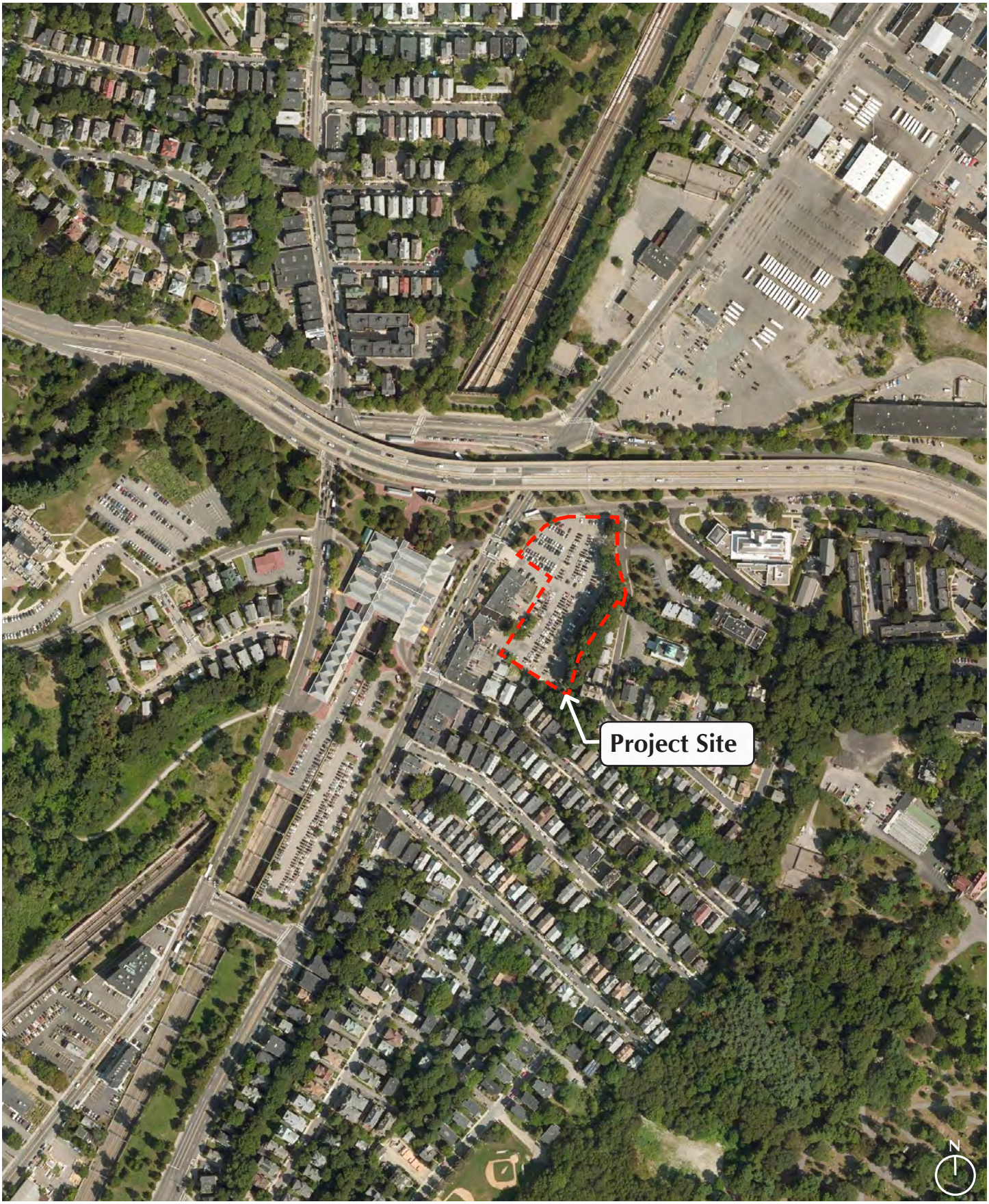
Jamaica Plain, Massachusetts

Figure 1-1
Locus Plan
Source: USGS, Fort Point Associates, Inc., 2016



Jamaica Plain, Massachusetts

Figure 1-2

Aerial View of Existing Site

Source: Bing Maps, Fort Point Associates, Inc., 2015 (this image is pre-demolition of Casey Overpass)

Jamaica Plain, Massachusetts

Figure 1-3
Project Context- Proposed Casey Arborway
Source: ICON Architecture, 2016

Chapter 2

PROJECT DESCRIPTION

CHAPTER 2: PROJECT DESCRIPTION

2.1 PROJECT SITE AND SURROUNDINGS

The approximately two-acre Project Site is located south of the Arborway in Jamaica Plain directly adjacent to the newly exposed stretch of the Arborway created by the recent demolition of the Casey Overpass. The Project Site is comprised of a 300+ space paid parking lot with vehicular access from Washington Street. There are no existing buildings on the Project Site.

The Project Site is roughly bounded by the Arborway and the MBTA Arborway Yard bus depot to the north and Washington Street and Hyde Park Avenue to the west. This stretch of Washington Street is lined with a number of businesses and restaurants. Directly across Washington Street, less than 500 feet from the Project Site, is the Forest Hills MBTA Station with the Arnold Arboretum beyond. Just north of the MBTA Station, across the Arborway is the southern end of the Southwest Corridor Park and bicycle path. The south and west of the Project Site are dominated by residential neighborhoods, consisting mainly of triple deckers to the south, and a smaller residential neighborhood consisting of single families, condominiums, two churches, and the West Roxbury Municipal Court to the east. Although the Project Site directly abuts a small row of single family homes to the east, there is a significant grade change and a line of trees which will both be retained to buffer the Project's impact. Franklin Park is approximately 0.25 miles east of the Project Site, and to the southeast is Forest Hills Cemetery. A variety of local shops and restaurants are accessible by foot and bicycle on Centre/South Street and Hyde Park Avenue including a Harvest Co-Op Market grocery store.

See Figure 2-1, Oblique View of Existing Site; Figure 2-2, Existing Conditions Survey; Figures 2-3 through 2-6, Existing Conditions Photographs, and Figure 2-7 Project Site Plan.

2.2 PROPOSED PROJECT

2.2.1 INTRODUCTION

The Project entails the redevelopment of a series of hardscaped parcels into a transit-oriented residential development including 252 housing units, approximately 5,500 sf mixed retail and commercial uses on Washington Street that will complement ongoing development in the surrounding context, and associated structured parking on the lower level. The Project is designed in three wood-framed buildings, A through C. Buildings A and B will be five to six-story residential buildings with parking below. Building C will be a 6-story building with residential

units comprising the upper floors, and retail and commercial space on the ground floor facing Washington Street.

The layout and shape of the buildings are designed to make the most efficient use of the Project Site, provide public and private open space, and to create ground floor space for retail frontage on Washington Street.

Table 2-1: Project Program

Project Component	Dimensions/Count
Project Site Size	91,730 sf
Gross Floor Area	280,000 sf
Floor Area Ratio	3.15
Residential	252 housing units
Bicycle Parking	252 covered resident spaces Exterior visitor spaces
Parking	140 spaces
Commercial Space	5,500 sf
Residential Amenity Space	9,000 sf
Open Space	30,000 sf

2.2.2 GROUND FLOOR USES

The ground floor of Building A will provide a combination of residential amenity space, outdoor terrace, and residential units. Building B combines 3-bedroom townhouses facing the open courtyard, a bicycle workshop facing the Arborway, and a building entry lobby internal to the site. Building C combines up to 5,500 sf of commercial space with a ground level entry lobby for the residences above.

2.2.3 RESIDENTIAL USES

The Residences at Forest Hills will include a total of 252 residential apartments at a mix of unit sizes, including 58 studios, 125 one-bedroom units, 58 two-bedroom units and 11 three-bedroom units. The Project will also offer innovative housing options, including townhouses, a Certified Artist live/work unit; and shared units consisting of 3 bedrooms with private bathrooms and common living and dining space.

In recognition of the importance of increasing the affordable housing stock in the Jamaica Plain/Forest Hills area, the Proponent proposes to provide an affordable housing component that exceeds the requirement set forth in the City's Inclusionary Zoning Ordinance and responds to the needs of renters with varying levels of income. Of the total of 252 residential units, 20% or 50 units will be offered for affordable housing with a minimum of 15% of total units offered at a rate of 70% of

Area Median Income (AMI) and the remainder offered at a range of AMI levels. The affordable units will be distributed among the unit types offered at the Project. For comparison, the affordable component required under the current ordinance is 13% or 33 units.

The Residences at Forest Hills is expected to appeal to renters who appreciate the neighborhood walkability, nearby transit access, the bicycle path, nearby shops and restaurants, and the neighborhood's abundant greenspace.

See Figures 2-8 through 2-12, Floor Plans.

2.2.4 PARKING AND ACCESS

The Project will include 10 surface spaces and 130 garage spaces. The total, 140 spaces, will result in a parking ratio of 0.56. The Project will provide indoor bicycle parking for residents at a rate of one per unit and exterior bicycle racks on-site for visitor cyclists. The Project will also provide a bicycle share program that allows tenants to sign out and use bicycles for free.

2.2.5 OPEN SPACE AND LANDSCAPING

The Project will engage and enhance the newly created public realm of the Arborway reconstruction, extending sidewalks and street furnishings against the Arborway pedestrian and bicycle paths. A major, new landscaped courtyard will connect the Arborway sidewalks into the Project Site, offering passive and active areas for both residents and neighbors alike. A south facing terrace on Building A will provide an outdoor amenity area for residents as well. The tree-lined hillside along Orchardhill Road will be maintained and improved, allowing a significant landscaped buffer between the Orchardhill Road neighbors and the Project..

2.2.6 CONSTRUCTION PHASING

The Project is planned to be built in one construction phase.

2.3 COMPLIANCE WITH BOSTON ZONING CODE

The Project is subject to land use controls contained in the City of Boston Zoning Code (the "Code"). In accordance with Article 80B of the Code, the Project is subject to the requirements of Large Project Review because it exceeds 50,000 sf of gross floor area. The Project will also be subject to review by the Boston Civic Design Commission under Article 28 and will be designed and constructed to be LEED-certifiable per Article 37, Green Buildings of the Code. A full description of its compliance with LEED credits is addressed in Chapter 4, Sustainability.

Map 9C of the Boston Zoning Maps indicates that the Project is located partially within an NS, or Neighborhood Shopping District and 3F, or Three-Family Residential Subdistrict, governed by Article 55 of the Boston Zoning Code, the Jamaica Plain Neighborhood District. The northern edge of the Project Site is located within the Greenbelt Protection Overlay District. The Project is located outside of the Restricted Parking Overlay District and the Groundwater Conservation Overlay District.

The Proponent anticipates that zoning relief will be required from the Zoning Board of Appeal for the Project for height, density, and other dimensional regulations of both the Neighborhood Shopping District and Three-Family Residential Subdistrict.

Jamaica Plain, Massachusetts

Figure 2-1
Oblique View of Existing Site
Source: Bing Maps, Fort Point Associates, Inc., 2016

LEGEND

● ■	CATCH BASIN
Ⓓ	DRAIN MANHOLE
Ⓔ	ELECTRIC MANHOLE
Ⓜ	MISCELLANEOUS MANHOLE
Ⓢ	SEWER MANHOLE
Ⓦ	WATER MANHOLE
GSO ○	GAS SHUT-OFF
WSO ○	WATER SHUT-OFF
GG ○	GAS GATE
WG ○	WATER GATE
	FIRE HYDRANT
UP	UTILITY POLE
UP W/ UE	
	LIGHT POLE
HH ▭	HAND-HOLE WITH CONDUIT LINE TO GROUND
BWW ▭	BOSTON WATER WORKS
FACB ■	FIRE ALARM CALL BOX
MP ●	METAL POST
S ●	SIGN POST
12"	DECIDUOUS TREE WITH TRUNK DIAMETER
12"	CONIFEROUS TREE WITH TRUNK DIAMETER
	HANDICAP PARKING
60m43	SPOT ELEVATION
CLF	CHAIN LINK FENCE
BB	BITUMINOUS CONCRETE BERM
VGC	VERTICAL GRANITE CURB
WCR	WHEELCHAIR RAMP
R=	RIM ELEVATION EQUALS
I=	INVERT ELEVATION EQUALS
TH=	TOP OF HOOD ELEVATION EQUALS
TT=	TOP OF TRAP
TOW=	TOP OF WATER
TW	TOP OF WALL ELEVATION
D	UNDERGROUND DRAIN LINE
E	UNDERGROUND ELECTRIC LINE
G	UNDERGROUND GAS LINE
S	UNDERGROUND SEWER LINE
W	UNDERGROUND WATER LINE
OHW	OVERHEAD WIRES
	BENCH MARK

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4. THE STATUS OF UTILITIES, WHETHER ACTIVE, ABANDONED, OR REMOVED, IS AN UNKNOWN CONDITION AS FAR AS OUR COMPILATION OF THIS INFORMATION.

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7. THE PROPER UTILITY ENGINEERING/COMPANY SHOULD BE CONSULTED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHOULD BE VERIFIED IN THE FIELD (V.I.F.) BEFORE PLANNING FUTURE CONNECTIONS. CONTACT THE DIG SAFE CALL CENTER AT 1-888-344-7233, SEVENTY-TWO HOURS PRIOR TO EXCAVATION, BLASTING, GRADING, AND/OR PAVING.

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3.) HORIZONTAL COORDINATES REFER TO MASSACHUSETTS STATE PLANE (MAIN LAND) NAD83.

4.) ELEVATION REFERS TO BOSTON CITY BASE(BCB) VERTICAL DATUM.

5.) CONTOUR INTERVAL EQUAL TO ONE FOOT.

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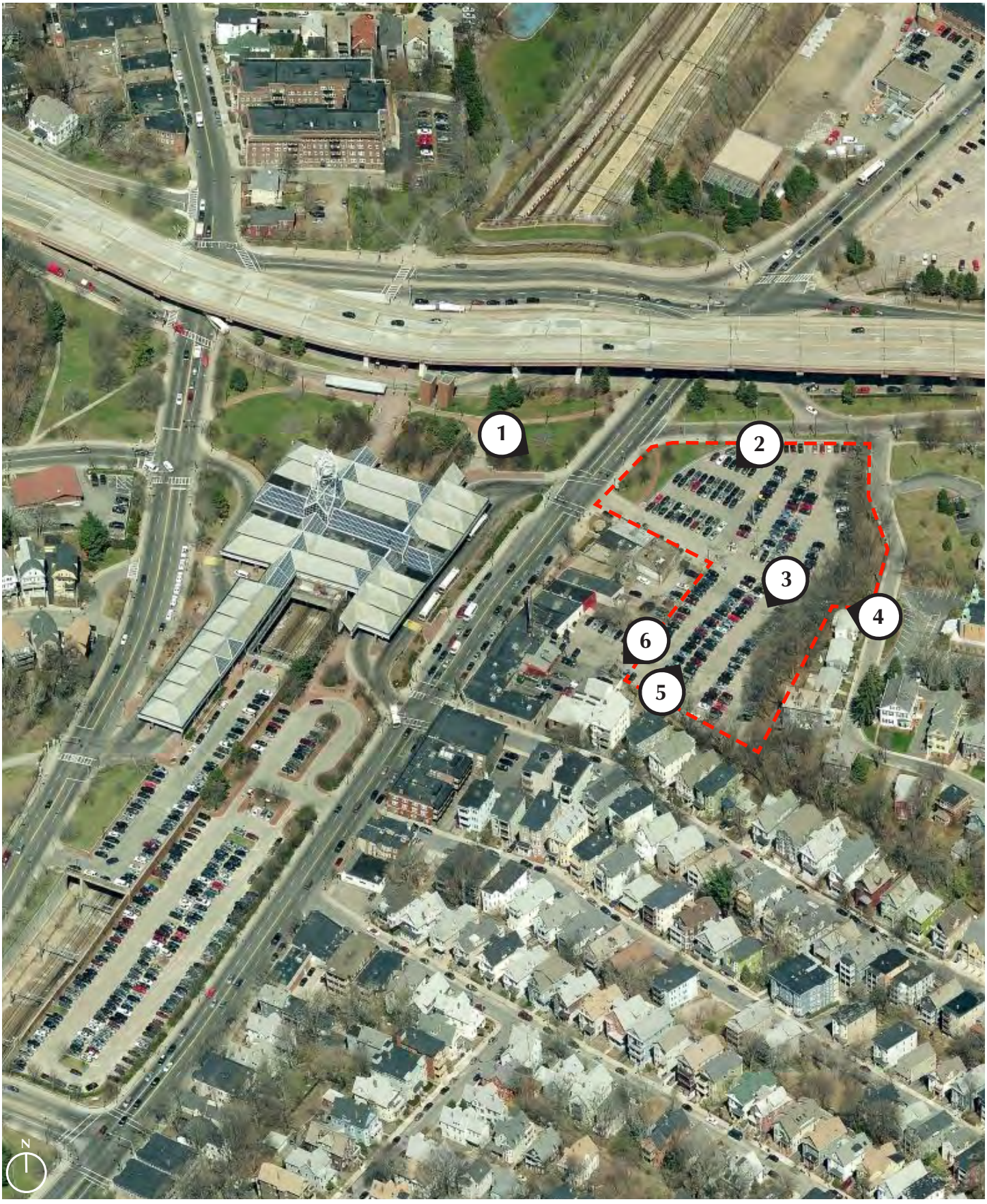
PROGRESS 1/27/2016

Figure 2-2
Existing Conditions Survey
Source: Nitsch Engineering, 2016



Jamaica Plain, Massachusetts

Figure 2-3

Existing Conditions Photographs- Key Plan

Source: Bing Maps, Fort Point Associates, Inc., 2016

1- View looking east from Forest Hills Station

2- View looking south from Arborway frontage road

Figure 2-4
Existing Conditions Photographs
Source: Fort Point Associates, Inc., 2016

3- View looking south from Project Site interior

4- View looking west from Orchardhill Road

Figure 2-5
Existing Conditions Photographs
Source: Fort Point Associates, Inc., 2016

5- View looking north from Project Site interior

6- View looking south from Project Site interior

Figure 2-6
Existing Conditions Photographs
Source: Fort Point Associates, Inc., 2016

Figure 2-7
Project Site Plan
Source: ICON Architecture, 2016

Figure 2-8
Floor Plan- Garage Level
Source: ICON Architecture, 2016

Figure 2-9
Floor Plan- Level 1
Source: Icon Architects, 2016

Figure 2-10
Floorplan- Level 2
Source: Icon Architects, 2016

Figure 2-11
Typical Floorplan- Levels 3-5
Source: Icon Architects, 2016

Figure 2-12
Floorplan- Level 6
Source: Icon Architects, 2016

Chapter 3

URBAN DESIGN

CHAPTER 3: URBAN DESIGN

3.1 INTRODUCTION

The Project proposes to transform a 2.2 acre, 300+ space parking lot into a vibrant, pedestrian-friendly, transit-oriented, mixed-use development with approximately 252 housing units and 5,500 sf of streetfront retail in three unique buildings. Located at a prominent corner along the new Arborway (reconfigured, and still in transition since the demolition of the Casey Overpass), the development will mark a key gateway into the Forest Hills commercial district where Washington Street crosses the Arborway. The Project will engage the broad, landscaped sidewalks and bicycle paths along the new Arborway, and take advantage of its location directly across the street from the MBTA Forest Hills Station.

The Project Site is bounded by the Arborway to the north, Orchardhill Road and residences to the east, commercial and residential uses to the south, and commercial uses and the MBTA Forest Hills Station to the west. The Project Site is composed of three parcels bisected by the Boston Water and Sewer Commission Stony Brook Conduit running generally in a north/south direction. With the exception of a vegetated hillside along the easterly Project Site edge, which will be protected and enhanced as part of the Project, the Project Site is almost exclusively hardscape and functions primarily as a commuter parking lot for Forest Hills MBTA Station patrons. Access to the lot is provided from Washington Street See Figure 3-1, Neighborhood Context.

3.2 MASSING

The Project will consist of approximately 252 housing units in three wood-frame buildings over a partial single-level podium garage with approximately 130 structured parking spaces and 10 surface parking spaces. The garage will include bicycle storage areas and charging stations for electric cars. The rental unit mix will include studios, one-, two- and three-bedroom apartments and three-bedroom townhouses.

Rather than a large, singular architectural gesture that fills out the parcel, the Project is conceived as a group of differently scaled, complementary buildings, each with a character that respects the neighboring context and the historic, incremental growth of the neighborhood:

- Building A – is U-shaped to hold its mass away from residences above it to the east on Orchardhill Road. The building also steps down in height from six stories to five stories to reduce its scale next to commercial and residential buildings along Tower Street. A courtyard between building wings will be landscaped for residential

outdoor amenity and interior amenity areas for the residents will look out onto the courtyard. Some private patios will be created adjacent to the apartments that surround the deck area. A pool may be included as part of the residential amenity.

- Building B – will be six stories. Duplex townhouses line its lower level to engage the landscaped central courtyard. The building has been pulled away from the easterly property line to maximize the distance from the Orchardhill Road neighbors.

- Building C – at six stories, will include approximately 5,500 sf ground level commercial space looking out onto Washington Street, visually connecting to the existing commercial buildings to its south. Glass storefronts will line this lower level facade, allowing passersby to look into the retail space. The retail will also have a facade along the interior courtyard, where a landscape plaza will allow outdoor seating. The residential lobby for this building will face the interior courtyard.

The relatively flat Project Site sits at the lower elevation of Washington Street. The eastern property boundary rises steeply along the length of Orchardhill Road, to a height of approximately 40 feet above the current parking lot. The design takes advantage of this height differential, burrowing the new buildings in the flat of the hillside valley, so that their height will sit lower than the height of the homes at the top of Orchardhill Road. Thus, the scale of the Project is relatively diminished from viewing above. See Figures 3-2 through 3-7, Perspective Views, and Figure 3-8, Section Through Project Site.

3.3 CHARACTER AND MATERIALS

The design approach distinguishes both a prominent Arborway location as well as an internal courtyard through the use of varying materials and textures. Each building facade is distinguished through material choice and window patterns. Facing the Arborway, metal shingle facades on Buildings B and C provide a rich texture with a lively pattern. Large punched openings in these facades reveal groups of residential decks, and engage the larger scale of the broad parkway. The top floors step back, creating a penthouse level further away from the street face with a change of color and materials and highlighted by a trellis.

Commercial use will be expressed at the base of Building C with expanses of storefront glass, metal panels and canopies, opening onto the Arborway sidewalks. The ground floor steps back, allowing the residential levels above to provide cover over the walkway edging the buildings. Tree like columns support the building above, highlighting the dense landscape character of the adjacent Arborway.

Within the courtyard, materials change to a more residential siding, with building entries and bays projecting from the facades to add shadow and interest. Numerous grouped bays add a playful character to these facades. Duplex townhouses line the ground floor of

Building B, expressing a two-story, residential scale along the courtyard. The upper floor is highlighted by a color and material change, and trellises highlight the ends of the building. See Figure 3-9, Building Elevations.

3.4 OPEN SPACE AND LANDSCAPE

The proposed landscape and streetscape improvements are described in this section.

3.4.1 STREETSCAPE

The Project intent is to enhance the public realm around the Project Site, and develop appropriately scaled buildings for the area that recognize its unique location at this prominent gateway along the Arborway. The Project will edge and engage the pedestrian and bicycle paths being created as part of the Arborway reconstruction. Ground level retail will engage the sidewalk along Washington Street, extending the lively existing commercial district to the west up to the Arborway. A shared driveway off Washington Street will provide entry for vehicles, bicycles, and pedestrians, as well as provide short-term parking for the retail uses along either side. Broad landscaped sidewalks line both sides of this drive creating a safe passage area for residents going to or returning from the Forest Hills Station.

Townhouses and a bicycle work room for residents line the Arborway facade of Building B, overlooking the new pedestrian and bicycle paths.

3.4.2 CENTRAL COURTYARD

A broad opening between the buildings along the Arborway will link to the central courtyard of the Project, inviting residents and guests alike to enjoy the landscaped plaza and commercial entries from this area. A paved plaza adjacent to the retail space will provide a place for outdoor dining or activity at the edge of the courtyard. A wide central paved pedestrian pathway will connect across the Project Site, linking building entries. A wide "lawn" will edge the eastern side of the courtyard, connecting narrower private paths to duplex townhouse stoops along the ground floor of Building B. This rich, residential landscaped environment will provide for both passive and active amenity space for residents and retail patrons. The courtyard is oriented to capture optimum sunlight, with its broad end facing south.

A central landscaped turn-around at the courtyard's southern end will allow entering cars to drop residents off near building entries. The drive will continue down the slope of the hill, between Buildings A and B, to access the parking garage that links the buildings underground. There is no garage under Building C. Loading for Buildings A and B will be at the rear of the buildings at the lower level facing east.

3.4.3 COMMON TERRACE DECK AT BUILDING A

The common terrace at Building A is oriented to receive sunlight throughout the day, and to extend the landscaped buffer into the center of the Project Site. This terrace will be landscaped with a combination of hardscape and container plantings, creating a visual buffer against the residential facade when viewed from above on Orchardhill Road. The terrace will provide an outdoor amenity area for the residents, linked to indoor amenity spaces, and will offer passive landscape views between interior and exterior spaces. The terrace may include a pool. See Figure 3-11, Landscape Plan.

3.4.4 BUFFER PLANTINGS ALONG ORCHARDHILL ROAD

The Project has been carefully designed to retain the existing tree-lined hillside along the eastern edge of the property. The landscaping will be cleaned up and improved, ensuring that the mature plantings on this hillside will continue to provide a dense buffer to the homes along Orchardhill Road. A pedestrian pathway to Orchardhill will be added at the northeast corner of the Project Site.

3.5 VEHICULAR CIRCULATION AND PEDESTRIAN ENVIRONMENT

Retail space will activate the wide sidewalks of Washington Street and the Arborway. Consistent with pedestrian treatments elsewhere in the Forest Hills neighborhood, street furniture, trees, lighting, and sidewalk patterning will add to the experience for visitors and residents in the neighborhood. See Figure 3-11, Pedestrian and Vehicular Access.

3.6 CONSISTENCY WITH AREA PLANS

In 2008, the Boston Redevelopment Authority (BRA) undertook the Forest Hills Improvement Initiative (the "Initiative") to engage the residents, businesses, institutions, and organizations of Jamaica Plain in a community-based approach to improving the Forest Hills Station area and planning for the sale and development of several MBTA-owned parcels as well as other publicly-owned parcels around the station. The BRA worked in partnership with the MBTA, the Forest Hills Task Force, and area residents, businesses, institutions, and organizations throughout the process.

The Initiative imagines a reactivated and continuous streetscape animated by retail and residential uses and physically defined by building masses fronting the street. The full vision identifies the potential for multiple underutilized publicly-owned sites to transform the neighborhood from a scattering of industrial and infrastructure-related uses to a vital, mixed-use neighborhood anchored by a major transportation hub. Implementation of this vision has been ongoing though other Washington Street parcels remain either vacant, or in the

case of the MBTA bus servicing facility abutting the Arborway, are being used for purposes that disrupt the neighborhood urban fabric.

The Project will continue the long-term revitalization of Jamaica Plain's Washington Street corridor— reconnecting the Stony Brook neighborhood to Forest Hills by transforming a parking lot into a lively and dense residential community with retail on the ground floor. When completed, the Project will provide an improved commercial corridor along Washington Street and provide additional residential density directly adjacent to the Forest Hills Station. It will animate the edges of what is now a barren and uninviting sidewalk with new street trees and lighting. The Project will continue, along its northern border, the application of the Greenbelt Protection Overlay District with landscaping along the Arborway.

Use and Design Guidelines released for parcels in this district outlined a list of core principles to guide development, including the following:

- Improved traffic patterns,
- Vibrant mixed use district,
- Community orientation,
- Green/sustainable development, and
- Green space assets.

The Project advances the spirit of these core principles. The Project is a transit-oriented development located in proximity to area trains, buses, and on- and off-road bicycle paths. The development fosters a community orientation by creating mixed-uses with housing, commercial/retail areas, and public and private open space. The Project is designed to provide a healthy and energy-efficient environment for residents and will meet the LEED Silver certifiable level, promoting the Initiative's sustainability principle. Lastly, the Project will have on-site open space for residents and guests and is a short walk from acres of greenspace in Jamaica Plain, including the Southwest Corridor Park, Arnold Arboretum, Franklin Park, and Forest Hills Cemetery.

Figure 3-1
Neighborhood Context
Source: Fort Point Associates, Inc., 2016

Figure 3-2
Perspective View Looking South on Washington Street
Source: ICON Architecture, 2016

Figure 3-3
Perspective View from Forest Hills Station
Source: ICON Architecture, 2016

Jamaica Plain, Massachusetts

Figure 3-4
Perspective View at Orchardhill Road on Arborway
Source: ICON Architecture, 2016

Figure 3-5
Perspective View of Entry Courtyard
Source: ICON Architecture, 2016

Jamaica Plain, Massachusetts

Figure 3-6
Perspective View from Orchardhill Road
Source: ICON Architecture, 2016

Figure 3-7
Perspective View from Tower Street
Source: ICON Architecture, 2016

Figure 3-8
Section Through Project Site
Source: ICON Architecture, 2016

3 COURTYARD ELEVATION

2 ORCHARDHILL ELEVATION

KEY PLAN

1 ARBORWAY/WASHINGTON ELEVATION

Figure 3-9
Building Elevations
Source: ICON Architecture, 2016

Figure 3-10
Pedestrian and Vehicular Access
Source: ICON Architecture, 2016

Chapter 4

SUSTAINABILITY

CHAPTER 4: SUSTAINABILITY

4.1 ARTICLE 37 / LEED COMPLIANCE

The Project will achieve compliance with the City of Boston's Article 37 Green Building standards and the Governor's Executive Order 484 – Leading by Example – Clean Energy and Efficient Buildings. The Proponent anticipates that the Project will achieve a minimum of LEED Silver certifiable level by demonstrating compliance with all of the prerequisites and up to 50 credit points of the LEED 2009 Rating System for New Construction and Major Renovations rating system.

The Project will strive for the responsible use of resources, including energy, water, and materials, while providing a healthy and comfortable environment for its occupants. Article 37 of the Boston Zoning Code requires that projects that are subject to Article 80B, Large Project Review, be LEED certifiable. The Project will use the LEED for New Construction 2009 rating system to demonstrate Article 37 compliance. The LEED rating system tracks the sustainable features of the Project by assigning points in the following categories: Sustainable Sites; Water Efficiency; Energy & Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation & Design Process.

Major sustainable design elements of the overall Project include:

- Redevelopment of a currently under-utilized transit-oriented site. The Project is in an urban area, close to regional and local public transportation. The new residential buildings will be located near public transportation on the MBTA's Forest Hills Orange Line and bus lines, encouraging minimal vehicle use.

- The Project will embody urban principles encouraging public transportation, bicycle, and pedestrian activity. The use of vehicles at this site is expected to be minimal in comparison to the public transportation and pedestrian trips. Other transportation related characteristics include:

    - Covered bicycle parking will be included for residents. Visitor bicycle parking will be located adjacent to the primary building entrances.

    - Seven electrical car charging stations (5% of provided parking spaces).

- Mechanical Systems:

    - No CFCs or HCFCs will be used in cooling equipment.

- The Project will seek to save energy across systems with energy efficient equipment and appropriate insulation.

- High efficiency lighting with occupancy sensors will be incorporated where suitable.

- Residential Units:

  - ENERGY STAR appliances, lighting and low-flow fixtures will be integrated into residential units.

  - Operable and high-quality insulated glass will allow residents to control air movement within the units.

4.2 LEED CREDIT NARRATIVE

The following is a credit-by-credit analysis of the Project team's approach for achieving LEED-NC v2009 at the Silver level. See Figure 4-1, LEED-NC v2009 Checklist.

4.2.1 SUSTAINABLE SITES (22) POINTS

SSp1 **Construction Activity Pollution Prevention:** An Erosion and Sedimentation Control Plan will be established to control erosion, waterway sedimentation and airborne dust generation during construction, conforming to local codes and the EPA Construction General Permit (Phase I and Phase II) of the National Pollutant Discharge Elimination System Program (NPDES)

SSc1 **Site Selection:** The Project was previously developed, and the Project will not be developed on any restricted sites. (1) Point

SSc2 **Development Density:** The Project site was previously developed and is within ½ mile of a dense residential area in Boston. It is also within ½ mile, with pedestrian access, of at least 10 basic services. (5) Points

- Restaurants: The Dogwood, Forest Hills Diner

- Park: Southwest Corridor Park, Arnold Arboretum

- Place of Worship: Covenant Congregational Church, St. Andrew Ukrainian Orthodox Church

- Beauty Salon: Stephanie Hair Salon, Klassy Kuts

- Bank: Western Union/Forest Hills Check Cashing

- Bank: East Boston Savings Bank, Mass Bay Credit Union
- Community Center: West Roxbury Municipal Court
- Convenience Grocery: Harvest Co-Op Market, Forest Hills Convenience

SS 4.1 **Alternative Transportation - Public Transportation Access:** The Project is located within 0.5 mile from the MBTA Forest Hills Orange Line Station, Commuter Rail Needham Line, and Bus Station (20 different bus routes). (6) Points

SS 4.2 **Alternative Transportation - Bicycle Storage and Changing Rooms:** The Project will provide approximately 250 bicycle storage spaces which will be in excess of the 15% of the building occupants. The Proponent will provide one bicycle parking space for each residential unit, as required by the Bicycle Parking Guidelines- Boston Transportation Department and Complete Streets Guidelines. (1) Point

SSc4.3 **Alternative Transportation - Low-Emitting and Fuel-Efficient Vehicles:** The proponent will provide alternative fueling stations for 5% of the total vehicle parking capacity (7 stations). (3) Points

SSc4.4 **Alternative Transportation - Parking Capacity:** Parking density has been sized not to exceed the minimum zoning requirements. Drop off area will be incorporated into the Project. (2) Points

SSc5.1 **Site Development – Protect or Restore Habitat:** The Project will exceed the 20% requirement for native and adaptive vegetation with a combination of green areas on the ground floor and roof area. (1) Maybe

SSc6.1 **Stormwater Design – Quantity Control:** The proponent aims to increase pervious surfaces, and will implement a stormwater management plan that results in a 25% decrease in the volume of runoff from the 2-year 24 hour design storm. (1) Point

SSc7.1 **Heat Island Effect – Non roof:** a majority of the parking will be located under cover, either under the building, or under the courtyard patio of Building A. The courtyard patio will have an SRI of at least 29, or be planted. (1) Point

SSc7.2 **Heat Island Effect - Roof**: Roofing materials are specified with a solar reflectance index (SRI) equal to or greater than a value of 78 for a minimum of 75% of the roof surface. (1) Point

4.2.2 WATER EFFICIENCY (5) POINTS

WEp1 **Water Use Reduction:** The project will employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building, not including irrigation. (5) Points

WEc1 **Water Efficient Landscaping:** The landscaping will be designed to reduce potable water for irrigation by 50% from a calculated midsummer baseline case. (2) Points

WEc3 **Water Use Reduction:** An additional reduction to 36% will be achieved with 1.28 gpf toilets, 1.0 gpm lavatory and 1.75 gpm showers. (3) Points

4.2.3 ENERGY AND ATMOSPHERE (5) POINTS (10) MAYBE

EAp 1.1 **Fundamental Commissioning of Building Energy Systems:** Commissioning process activities will be completed for the following energy related systems, at a minimum:

- Heating, ventilating, air conditioning, and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls;
- Lighting and daylighting controls;
- Domestic hot water systems; and
- Renewable Energy Systems (wind, solar, etc.)

EAp 2 **Minimum Energy Performance:** Use a computer simulation model to assess the energy performance and identify the most cost- effective energy efficiency measures.

Through Whole Building Energy Simulation, the proponent will demonstrate a 10% improvement in the proposed building performance rating, compared with the baseline building performance rating. The baseline building performance rating will be calculated according to Appendix G of ASHRAE 90.1-2007 using a computer simulation model for the whole building project. For this project, Option One is the eligible path.

The proposed design must meet the following criteria:

- Comply with mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) in Standard 90.1-2007 (with errata but without addenda).
- All energy costs associated with the building project will be included.

- Compare against a baseline building that complies with Appendix G of St. 90.1-2007.

While the Project is required through LEED to meet minimum 15% energy cost savings compared to ASHRAE 90.1-2007, Appendix G, Massachusetts Stretch Code requires achieving 20% or greater.

EAp3 **Fundamental Refrigerant Management:** It is the intent of the Project to use zero CFC based refrigerants in the new base building heating, ventilating, and air conditioning and refrigeration systems.

EAc1 **Optimize Energy Performance:** The Project will strive to optimize energy performance and realize energy cost savings of 21% compared with ASHRAE 90.1 2007 (Note: Massachusetts Stretch Code requires achieving 20% or greater). Documentation will be produced via Whole Building Energy Simulation, which also provides for EA Prerequisite 2. (5) Points (5) Maybe

EAc4 **Enhanced Refrigerant Management:** The Proponent will confirm calculations for the Enhanced Refrigerant Management standard when final equipment is selected. (2) Maybe

EAc5 **Measurement and Verification:** The Project will meet MPR6 through the establishment of an ENERGY STAR Portfolio Manager account to enable the USGBC to review whole building energy and water use for five years after occupancy. (3) Maybe

4.2.4 MATERIALS AND RESOURCES (5) POINTS (1) MAYBE

MRp1 **Storage and Collection of Recyclables:** An easily accessible area will be provided for the collection and storage of materials for recycling for the entire building. Materials will include paper, corrugated cardboard, glass, plastics, and metals.

MRc2 **Construction Waste Management:** The construction team shall institute a Construction Waste Management Plan, including investigation of local options for waste diversion and documentation of diversion rate for construction waste. The team intends to divert 75 percent of waste. (2) Points

MRc4 **Recycled Content: 20% of Content:** Ten percent of Project materials will be recycled content materials. (2) Points

MRc5 **Regional Materials: 10% of Materials, 20% of Materials:** Ten percent of Project materials will be regional materials. (1) Point

MRc7 **Certified Wood:** It is the intent of the Project to install no tropical wood, to install FSC certified wood products and to provide suppliers with a notice of preference for FSC products and to request the country of manufacture for each product. (1) Maybe

4.2.5 INDOOR ENVIRONMENTAL QUALITY (7) POINTS (4) MAYBE

IEQp 1 **Minimum Indoor air Quality Performance:** The Project will meet the minimum requirements of Sections 4 through 7 of ASHRAE Standard 62.1-2007, Ventilation for Acceptable Air Quality (with errata but without addenda). Mechanically ventilated spaces must be designed using the ventilation rate procedure of the applicable local code, whichever is more stringent. Naturally ventilated buildings must comply with ASHRAE Standard 62.1-2007, paragraph 5.1 (with errata but without addenda).

IEQp2 **Environmental Tobacco Smoke (ETS) Control:** It is the intent of the Project to prohibit smoking within living units, in common areas, exterior areas on the property that are within 25' from entries, air intakes and windows and to communicate these prohibitions in the tenant handbook.

IEQc3.1 **Construction Indoor Air Quality Management Plan – During Construction:** The Proponent will develop and implement an IAQ management plan for the construction and pre-occupancy phase of the building. (1) Point

IEQc4.1 **Low- Emitting Materials - Adhesives and Sealants:** Low VOC materials are specified in the construction documents. All adhesives and sealants used on the interior of the building will comply with the South Coast Air Quality Management District Rule #1168. All Aerosol Adhesives will comply with Green Seal Standard for Commercial Adhesives GS-36 requirements in effect on October 19, 2000. (1) Point

IEQc4.2 **Low-Emitting Materials - Adhesives and Sealants:** Low VOC paints and coatings are specified in the construction documents. (1) Point

IEQc4.3 **Low-Emitting Materials – Flooring Systems:** All flooring will comply with this requirement. (1) Point

IEQc4.4 **Low-Emitting Materials, Composite Wood & Agrifiber Products:** The Proponent plans to prioritize use of no added urea formaldehyde but cannot commit to achieving this for all wood products. (1) Maybe

IEQc5 **Indoor Chemical & Pollutant Source Control:** The Proponent is evaluating compliance with all requirements for indoor chemical and pollutant source control. (1) Maybe

IEQ 6.1 **Controllability of Systems - Lighting:** The Project is designed to comply with the standard by providing individual lighting controls for at least 90% of the occupants. (1) Point

IEQ 6.2 **Controllability of Systems – Thermal Comfort:** All housing units will be provided with individual heating and cooling equipment that can be controlled by residents. In this way, residents will have control to adjust thermal conditions for a more comfortable environment. Housing units will be equipped with operable windows for natural ventilation purposes. All windows are equipped with blinds to accommodate local control of light and solar exposure. (1) Point

IEQc7.2 **Thermal Comfort Verification:** If ASHRAE 55 is met, the Proponent will survey the occupants six to 18 months following completion of the improvements to assess if they are satisfied with the thermal conditions in the building. A corrective action plan will be designed and implemented if greater than 20% of occupants report dissatisfaction with a certain element of thermal comfort. (1) Maybe

IEQc8.2 **Daylight and Views – Views:** The Project intends to provide a direct line of sight via glazing between 30 and 90 inches above the floor for building occupants in 90% of all regularly occupied spaces. (1) Point

4.2.6 INNOVATION IN DESIGN (4) POINTS

ID 1.1 **Innovation and Design – Energy Star Appliances:** The Project intends to provide achieve the ENERGY STAR Appliances Credit through the LEED CI rating systems, as all appliances will be specified to be ENERGY STAR. (1) Point

ID 1.3 **Innovation and Design – Green Housekeeping:** To reduce the exposure of building occupants and maintenance personnel to potentially hazardous chemical, biological and particulate contaminants, the project will develop a green cleaning policy for the building and Project Site. (1) Point

ID 1.4 **Innovation and Design –Education & Outreach:** The Project will develop an education and outreach plan that will include 2 of the following; signage, manual, or tour. (1) Point

ID 2 **LEED Accredited Professional:** A LEED Accredited Professional is part of the team. Nancy Ludwig, FAIA, LEED AP is the Principal-in-charge. (1) Point

4.2.7 REGIONAL PRIORITY (4) POINTS

Regional Priority: SSC6.1 – **Stormwater Design – Quantity Control** The proponent aims to increase pervious surfaces, and will implement a storm-water management plan that results in a 25% decrease in the volume of runoff from the 2-year 24 hour design storm. (1) Point

Regional Priority: SSC7.1 **Heat Island Effect- Non-Roof** A majority of the parking will be located under cover, either under the building, or under the courtyard patio of Building A. The courtyard patio will have an SRI of at least 29, or be planted. (1) Point

Regional Priority: SSC7.2 **Heat Island Effect- Roof** Roofing materials are specified with a solar reflectance index (SRI) equal to or greater than a value of 78 for a minimum of 75% of the roof surface. (1) Point

LEED 2009 for New Construction and Major Renovations

Project Checklist

Project Name: The Residences at Forest Hills

Date: 8/25/16

Sustainable Sites — Possible Points: 26

Y	?	N			
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
		1	Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1

Water Efficiency — Possible Points: 10

Y			Prereq 1	Water Use Reduction—20% Reduction	
2		2	Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
3		1	Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 35

Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
5	5	9	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
		2	Credit 3	Enhanced Commissioning	2
	2		Credit 4	Enhanced Refrigerant Management	2
	3		Credit 5	Measurement and Verification	3
		2	Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	?	N			
2			Credit 4	Recycled Content	1 to 2
1			Credit 5	Regional Materials	1 to 2
		1	Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1

Indoor Environmental Quality — Possible Points: 15

Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
		1	Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
		1	Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
	1		Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
	1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
	1		Credit 7.1	Thermal Comfort—Design	1
		1	Credit 7.2	Thermal Comfort—Verification	1
		1	Credit 8.1	Daylight and Views—Daylight	1
1			Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process — Possible Points: 6

1			Credit 1.1	Innovation in Design: Specific Title	1
1			Credit 1.2	Innovation in Design: Specific Title	1
1			Credit 1.3	Innovation in Design: Specific Title	1
		1	Credit 1.4	Innovation in Design: Specific Title	1
		1	Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

1			Credit 1.1	Regional Priority: Specific Credit	1
1			Credit 1.2	Regional Priority: Specific Credit	1
1			Credit 1.3	Regional Priority: Specific Credit	1
		1	Credit 1.4	Regional Priority: Specific Credit	1

Total — Possible Points: 110

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

Figure 4-1

LEED-NC v2009 Checklist

Source: ICON Architecture, 2016

Chapter 5

TRANSPORTATION

CHAPTER 5: TRANSPORTATION

5.1 INTRODUCTION

MDM Transportation Consultants, Inc. (MDM) has prepared an evaluation of transportation impacts for the proposed mixed-use re-development of 3694 Washington Street located in the Jamaica Plain neighborhood of Boston, Massachusetts. This transportation study is prepared following the Boston Transportation Department (BTD) *Transportation Access Plan Guidelines* as well as traffic study guidelines as jointly issued by the Commonwealth of Massachusetts Executive Office of Energy & Environmental Affairs/Massachusetts Department of Transportation (EEA/MassDOT) in support of the Boston Planning and Development Agency (BPDA) Article 80 review process and DCR Access Permit process. The evaluation documents 2035 Baseline transportation conditions, 2035 Build conditions with the Project, and describes access, pedestrian, and transportation improvements that serve to accommodate Project-related traffic, loading and pedestrian activity including elements of a Transportation Demand Management (TDM) program for the Project.

5.1.1 PROJECT DESCRIPTION

The Project Site comprises approximately 2.2 acres bounded by Arborway to the north, residential homes to the south, Orchardhill Road to the east, and Washington Street and commercial properties to the west in Jamaica Plain, Massachusetts. The Project Site is currently occupied by a private parking lot operated by LAZ Parking with approximately 306 surface parking spaces. The proximity of the Project Site in relation to the adjacent roadway system is shown in Figure 5-1, Site Location.

As described previously in the PNF, the Project has evolved based on input the Proponent received during discussions with the community. The current proposal includes 252 residential apartment units, 5,500 square feet (sf) of ground-level retail use and 140 parking spaces (130 in a parking structure and 10 surface lot spaces). At the time the traffic analysis was conducted, the proposal included 264 apartment units, 6,000 sf of retail and 151 parking spaces. As this development program is larger than what is currently proposed, the traffic analysis presented herein represents a conservative, worst-case assessment of potential project impacts.

Project Site access/egress will be provided via the existing driveway serving the Site along Washington Street. A preliminary site plan is illustrated in Figure, 5-2, Project Site Plan.

5.1.2 STUDY METHODOLOGY

This transportation evaluation is conducted in accordance with BTD *Transportation Access Plan* guidelines, and consists of several steps. The first step documents

conditions in the transportation study area including an inventory of roadway geometry, traffic volumes, public transportation, parking, public transportation, pedestrian facilities, and safety characteristics. Given that the elevated Arborway has been removed and the study intersections are under construction, data used in this study were obtained from the Casey Arborway Functional Design report[1]. Baseline 2035 traffic conditions are forecast that account for normal area growth, other planned area developments, and planned roadway improvements in the area, which are currently under construction. Build conditions were then developed by adding the development-related traffic increases beyond what was planned for in the design report to the Baseline networks. The third step quantifies operating characteristics of the study intersections under Baseline and future Build conditions to determine the need for traffic mitigation measures. The final step identifies mitigation actions necessary to Project-related impacts and to address traffic, pedestrian, bicycle, transit, safety, and construction period needs required to support the Project.

5.1.3 STUDY AREA

This study evaluates transportation characteristics of roadways and intersections that provide a primary means of access to the Project Site, and that are likely to sustain a measurable level of traffic impact from the Project. The study area includes the following intersections, which were identified in consultation with the Boston Transportation Department and as shown on Figure 5-1, Site Location:

1 - Washington Street at Site Driveway/ MBTA Bus Entrance – Signalized
2 - Washington Street at Arborway – Signalized
3 - South Street at Arborway – Signalized
4 - Arborway at Westbound U-turn – Signalized
5 - Arborway at Eastbound U-turn – Signalized

[1] *Casey Arborway Functional Design Report, Boston, Massachusetts,* prepared by McMahon and HNTB, dated October 2012.

5.2 BASELINE CONDITIONS

In order to provide a basis for quantifying the transportation impacts of the development, the baseline roadway system and the baseline traffic operations of study area roadways were reviewed. This section describes the baseline transportation characteristics within the study area including baseline traffic volumes, pedestrian and bicycle facilities and volumes, parking and public transportation systems serving the area.

5.2.1 ROADWAY NETWORK

The study area roadways are described briefly in this section. A general description of the physical roadway features is provided in the following sections. Baseline conditions are described that include planned roadway improvements in the area, which are currently under construction as part of MassDOT's Casey Arborway Project. The study area includes roadways under local and state (MassDOT/ DCR) jurisdiction.

Washington Street/ Hyde Park Avenue

Washington Street/ Hyde Park Avenue is generally a north-south roadway under local jurisdiction within the study area. The roadway is classified by MassDOT as an Urban Principal Arterial roadway and provides a connection between the New Washington Street to the north and Neponset Valley Parkway to the south. The roadway provides four travel lanes in each direction within the study area with additional travel lanes provided at its major intersections. Sidewalks and on-street parking are provided along both sides of the roadway with a drop-off/pick-up area located adjacent to Forest Hills Station. Land use along Washington Street/Hyde Park Avenue within the immediate study area includes a mix of residential, retail/commercial, office uses, restaurants, recreational areas, and the Forest Hills Station.

Arborway

Arborway is a truck restricted east-west roadway under State jurisdiction (DCR) that connects Jamaica Pond to the west to Shea Circle to the east. Arborway is classified by MassDOT as a Principal Arterial roadway generally provides two travel lanes in each direction. The roadway is currently under construction to remove the elevated section of the Arborway and replace it with a median separated at grade roadway. Under future conditions, the roadway will provide two to three travel lanes in each direction with a separate bikeways and sidewalks on both sides of the roadway. Land uses along Arborway include but are not limited to residential properties, the Forest Hills Station, a courthouse, a church, and recreational areas with direct access/egress to the Arborway restricted within the study area.

Arborway Frontage Road (Washington Street to Shea Circle)

This section of the Frontage Road system is an eastbound roadway under DCR jurisdiction that runs parallel to the Arborway connecting Washington Street to Shea Circle. The Frontage Road is classified as a local roadway by MassDOT. A sidewalk is provided along its southern side and parking is allowed near the courthouse. The roadway provides access for a courthouse, residential land uses, a church, and historically provided parking for the courthouse under the elevated Arborway. Said parking under the Arborway will be relocated along the northern side of the Arborway in the vicinity of the courthouse.

South Street

South Street is a north-south roadway under local jurisdiction that connects Washington Street/ Arborway to the south with Centre Street to the north. South Street provides one travel lane in each direction separated by a double yellow centerline. Sidewalks and on-street parking are provided on both sides of the roadway. Within the immediate study area, land uses along South Street are primarily residential uses but also include neighborhood commercial uses.

Washington Street

Washington Street is generally a north-south roadway under local jurisdiction within the study area. The roadway is classified by MassDOT as an Urban Principal Arterial roadway and provides a connection between the Court Street to the north and Water Street in Foxborough to the south. The roadway is divided in to segmented sections as follows:

To the north of the Arborway, the roadway provides one travel lane in each direction within the study area with additional travel lanes provided at its major intersections. Sidewalks and on-street parking are provided along both sides of the roadway. Land use along Washington Street within the immediate study area includes a mix of residential, retail/commercial, office uses, restaurants, and the MBTA bus/employee parking.

To the south of the Arborway, the roadway provides two travel lanes in each direction within the immediate study area with additional travel lanes provided at its major intersections. Sidewalks and on-street parking are provided along both sides of the roadway. Land use along Washington Street within the immediate study area includes the Forest Hills Station.

5.2.2 INTERSECTION DESCRIPTIONS

The study area intersections are described briefly in this section. Baseline conditions are described that include planned roadway improvements in the area, which are currently under construction as part of MassDOT's Casey Arborway Project. Key design plans are provided in the Appendix.

1- Washington Street at Site Driveway/ MBTA Bus Loop Entrance– Signalized

Washington Street meets the Site Driveway/MBTA Bus Loop Entrance to form a four-legged signalized intersection. The Washington Street northbound and southbound approaches to the intersection consist of a shared left/through travel land and a shared through/right turn lane. The Site Driveway westbound approach to the intersection consists of a single left/through/right turn lane. The MBTA Bus Loop Entrance provides egress only movements from the intersection for MBTA buses. Painted crosswalks will be provided across all of the intersection approaches.

2- Arborway at Washington Street – Signalized

Arborway will meet Washington Street to form a four-legged signalized intersection. The Arborway eastbound approach to the intersection will consist of two through travel lanes and a shared through/right turn lane. The Arborway westbound approach to the intersection will consist of an exclusive left turn lane, two through travel lanes, and a shared through/right turn lane. The northbound approach to the intersection will consists of an exclusive left-turn lane, an exclusive through lane, and a shared through/right/turn lane. The southbound approach to the intersection will consist of an exclusive left-turn lane, an exclusive through lane, and a shared through/right/turn lane. Painted crosswalks will be provided across all of the intersection approaches.

3- Arborway at South Street/Washington Street – Signalized

Arborway will meet South Street to form a four-legged signalized intersection. The Arborway eastbound approach to the intersection will consist of three through travel lanes and an exclusive right turn lane. The Arborway westbound approach to the intersection will consist of two through travel lanes, and a shared through/right turn lane. The northbound approach to the intersection will consists of an exclusive left-turn lane, an exclusive through lane, and a shared through/right/turn lane. The southbound approach to the intersection will consist of an exclusive left-turn lane and a shared through/right/turn lane. Painted crosswalks will be provided across all of the intersection approaches.

4- Arborway at Westbound U-Turn– Signalized

Arborway will meet the Westbound U-turn to form a two-legged signalized intersection. The Arborway eastbound approach to the intersection will consist of

three through travel lanes. The Arborway westbound approach to the intersection will consist of an exclusive U-turn lane and two through travel lanes.

5- Washington Street at Arborway Eastbound U-Turn– Signalized

Arborway will meet the Eastbound U-turn to form a two-legged signalized intersection. The Arborway eastbound approach to the intersection will consist of an exclusive U-turn lane and two through travel lanes. The Arborway westbound approach to the intersection will consist of three through travel lanes.

5.2.3 PEDESTRIAN FACILITIES

An inventory of the existing sidewalk system and pedestrian crossings in the study area has been conducted and is documented in Figure 5-3, Existing Pedestrian Facilities. The study area is served by an existing sidewalk system that will connects to major area transportation hubs that include the Forest Hills Station which accommodates orange line subway service, commuter rail station service (Needham Line), and bus service.

5.2.4 CAR SHARING SERVICES

Car sharing services provide access to short-term vehicle transportation. Vehicles can be rented by the hour or day and all standard vehicle costs (gas, maintenance, insurance, etc.) are included in the rental fee. Vehicles are checked out for a period of time and returned to their designated location. There are currently two Zipcar car-sharing locations in the immediate vicinity of the Project Site, with nine vehicles. Six (6) of the existing Zipcars are located at the Project Site in the existing parking lot (adjacent to the Frontage Road and the remaining three (3) are located within a 5-minute walk (¼ mile) from the Project Site at the Forest Hills Station. A map of the existing Zipcar locations in the immediate study area is provided in the Appendix.

5.2.5 BICYCLE SHARING SERVICES

Bicycle sharing services provide access to short-term bicycle transportation. Hubway is Boston's shared bicycles system, which allows members to rent bicycles for a period and return them to any Hubway location. The system is designed for quick trips with the first 30 minutes free for members and an incurred user fee thereafter. Membership passes are available for purchase in daily (24 hour), 72 hour, monthly, and yearly increments. There are currently no bicycle docking stations located within the area.

5.2.6 BASELINE TRAFFIC VOLUMES

Given the on-going construction within the immediate project area and removal of the elevated section of the Arborway, traffic-volume data used in this study were obtained from the Casey Arborway Functional Design Report (FDR)[2]. Specifically, the 2035 Baseline traffic volumes used in this report are the Build At-Grade 2035 Traffic Volumes. Traffic data was collected for the FDR in June 2010 during the weekday morning (7:00 AM to 9:00 AM) and weekday evening (4:00 to 6:00 PM). These hours represent the combination of busiest activity periods of the Project Site and adjacent roadway network. Vehicle classification counts include car, truck, pedestrian and bicycle trips; detailed traffic counts are provided in the Appendix. A brief summary of the methodology used in the FDR is provided below.

Background Growth (25 Year Projections)

Background traffic includes demand generated by other planned developments in the area as well as demand increases caused by external factors. External factors are general increases in traffic not attributable to a specific development and are determined using historical data.

The FDR used a background growth rate of 5% over 25 years for vehicular volumes on the Arborway and 12% over 25 years for vehicular traffic on the surface roads in Jamaica Plain.

Site Specific Projects

Development of 2035 Baseline traffic volumes also considered traffic generated through the study area from other specific area developments. Review of FDR indicates that there are currently eight (8) proposed site-specific development projects in the area as summarized in Table 5-1.

[2] *Ibid 1.*

Table 5-1: Site-Specific Projects

Parcel	Land Use Category (Buildout Range)[1]		
	Housing Units (#)	Retail (sf)	Office (sf)
Arborway Yards	128	28,000	100,000
LAZ Parking Lot	64	12,000	-
MBTA Parcel S	-	33,600	135,200
MBTA Parcel U	96	3,200	-
MBTA Parcel V	-	3,209	6,418
MBTA Parcel W	-	10,386	15,429
3615 Washington Street	-	24,000	48,000
3521 Washington Street	27	17,600	28,000

[1]Source: Casey Arborway FDR Dated October 2012.

The FDR generated trips for each of the proposed site-specific projects based on ITE's Trip Generation Manual and applied mode share statistics developed by BTD for zone 6 for modes including auto, transit, and walking trips.

2035 Baseline Traffic Volumes

The 2035 Baseline traffic volumes are developed by increasing the existing volumes by approximately 5 percent along the Arborway and 12% along local roadways, adding traffic associated with the eight site-specific projects, and re-assigning trips associated with the proposed Casey Arborway Improvement project. The resulting 2035 Baseline traffic volumes (aka FDR Build At-Grade 2035 Traffic Volumes) are displayed in Figure 5-4 and Figure 5-5.

5.2.7 HISTORICAL DAILY TRAFFIC VOLUMES

Historical data obtained from the FDR included Automatic traffic recorder counts (ATRs) that were conducted along Washington Street; manual turning movement counts (TMCs) that were conducted at the existing study intersections. Daily traffic volumes along Arborway in the Project Site vicinity were collected in June 2010 and are summarized in Table 5-2 and included in the Appendix.

Table 5-2: Historical Traffic Volume Summary – Arborway West of Shea Circle

Time Period	Daily Volume (vpd)[1]	Percent Daily Traffic[2]	Peak Hour Volume (vph)[3]	Peak Flow Direction[4]	Peak Hour Directional Volume (vph)
Weekday Morning Peak Hour	27,100	8%	2,170	60% WB	1,296
Weekday Evening Peak Hour	27,100	8%	2,210	63% EB	1,398

[1]Two-way daily traffic collected in June 2010 expressed in vehicles per day without seasonal adjustment.

[2]The percent of daily traffic that occurs during the peak hour.

[3]Two-way peak-hour volume expressed in vehicles per hour.

[4]EB = Eastbound, WB = Westbound

As summarized in Table 5-2:

- *Arborway*. The daily traffic volume on the Arborway adjacent to the Project Site was approximately 27,100 vehicles per day (vpd) during a typical weekday. Peak hour traffic flow on the Arborway ranges from approximately 1,296 to 1,398 vehicles per hour (vph) adjacent to the Project Site, which represents 8 percent of daily traffic flow. The traffic flow on Massachusetts Avenue is significantly higher in the westbound direction during the weekday morning peak hour and significantly higher in the eastbound direction during the weekday evening peak hour. The travel pattern is consistent with commuter traffic relative to the major area roadways.

5.2.8 PEDESTRIAN AND BICYCLE VOLUMES

Given the highly urban characteristic of the study area and the close proximity to the public transportation services provided near the Project Site, the pedestrian and bicycle traffic activity was also observed. The resulting weekday morning, and weekday evening peak hour pedestrian & bicycle traffic volumes at the study intersections are provide in Figure 5-6 and Figure 5-7.

5.2.9 PUBLIC TRANSPORTATION

The Massachusetts Bay Transit Authority (MBTA) operates the orange lime subway service and Needham commuter rail service less than ¼ mile from the Project Site at the Forest Hills Station with access from Washington Street and Hyde Park Avenue. Figure 5-8, Public Transportation, presents the existing public transportation facilities in the area with specific route and schedule information for all available services provided in the Appendix.

Specific public transportation services currently operated in the immediate area of the Project Site is as follows:

- **MBTA Commuter Rail:** The Needham Commuter Rail runs from Needham Heights to South Station with a stop in the immediate area at Forest Hills Station with access/egress from Washington Street and Hyde Park Avenue. Service on this line generally runs on weekdays (M-F) 6:00 am to 11:00 pm, on Saturday 7:30 am to 12:00 am and no service on Sundays. Peak hour headways are approximately 30 minutes on weekdays to 2 hours on Saturday.

- **MBTA Subway Service:** The orange line subway runs from Forest Hills Station to Oak Grove Station with a stop in the immediate area at Forest Hill Station with access/egress from Washington Street and Hyde Park Avenue. Service generally runs Monday through Saturday 5:15 am to 1:50 am and Sunday's 6:00 am to 12:30 am with headways of between 6 and 13 minutes. Forest Hills Station also provides connections to various regional transit connections including Routes 16, 21, 30, 31, 32, 34, 34E, 35, 36, 37, 38, 39, 40, 42, 50, and 51.

- **MBTA Bus Routes:** MBTA bus service is provide 7-days a week less than ¼ mile from the Project Site at the Forest Hills Station with the following sixteen (16) MBTA bus routes:

  16 - Forest Hills Station - Andrew Station or UMass via Columbia Rd
  21 - Ashmont Sta - Forest Hills Sta. via Morton St.
  30 - Mattapan Sta - Forest Hills Sta. via Cummins Hwy & Roslindale Sq
  31 - Mattapan Sta - Forest Hills Sta. via Morton St.
  32 - Wolcott Sq or Cleary Sq - Forest Hills Sta. via Hyde Park Ave
  34 - Walpole Ctr or Dedham Line - Forest Hills Sta. via Washington St
  34E - Walpole Ctr or Dedham Line - Forest Hills Sta. via Washington St
  35 - Dedham Mall/Stimson St - Forest Hills Station via Belgrade Ave.
  36 - Charles River Loop or V.A. Hospital - Forest Hills Sta. via Belgrade Ave. and Centre St
  37 - Baker & Vermont Sts - Forest Hills Sta. via Belgrade Ave/ Centre St
  38 - Wren St - Forest Hills Sta via Centre & South Streets
  39 - Forest Hills Sta - Back Bay Sta via Huntington Ave.
  40 - Georgetowne - Forest Hills Sta via Washington St/ West Boundary Rd
  42 - Forest Hills Sta - Dudley or Ruggles Sta via Washington St
  50 - Cleary Square - Forest Hills Station via Roslindale Square
  51 - Cleveland Circle - Forest Hills Sta. via Hancock Village

- **School Bus Activity – Forest Hills Station:** Area school buses currently pick-up and drop-off curbside along Hyde Park Avenue and New Washington Street. As part of the Arborway project the lower parking lot located off Hyde Park Avenue has been re-designed to accommodate school bus pick-up/ drop-off activity, thus removing the existing school bus activity (8± hourly buses during the peak commuter periods) from curbside areas. A school bus layout for the local parking lot prepared for the Arborway project is provided in the Appendix.

5.3 BUILD CONDITIONS

The following sections provide an overview of projected 2035 Build transportation conditions in the study area.

5.3.1 SITE GENERATED TRAFFIC

Future 2035 Build condition traffic volumes were arrived at by first removing trips assumed for the Project Site redevelopment as part of the Casey Arborway FDR from the 2035 Baseline traffic volume networks, then estimating the number of peak-hour trips expected to be generated by the proposed development and finally adding the site-generated traffic onto 2035 Baseline traffic volume networks based on the projected distribution pattern. Future traffic operations with and without the proposed mixed-use development in place were then evaluated. The methodology utilized to estimate the future trip-generation characteristics of the proposed development are summarized below. In accordance with BTD and EEA/MassDOT guidelines, the traffic generated by the proposed development was estimated using trip rates published in ITE's *Trip Generation* for the Land Use Code (LUC) based on trip rates for Apartment (LUC 220) and High-Turnover Sit-Down Restaurant (LUC 932).

Projected Site Trip Removal – FDR Assumptions

As outlined in the 2012 FDR for the Casey Arborway improvement project, the Site was programmed for initial planning purposes to include 64 apartment units and 12,000 sf of retail use; these are solely initial planning assumptions and are not based on definitive master plans, thereby serving only as "placeholder" assumptions that are intended to be updated with specific program assumptions as individual parcels in Jamaica Plain are being advanced through local permitting. The FDR assumptions for the Site for vehicular, transit, and walking/bicycling trip as summarized in Table 5-3.

Table 5-3: Trip Generation by Mode Share – 2012 FDR Assumptions

Period/Direction	Automobile[1]	Walk/Bike[2]	Transit[3]	Total
Weekday Morning Peak Hour				
Entering	4	2	2	8
Exiting	5	2	5	12
Total	9	4	7	20
Weekday Evening Peak Hour				
Entering	27	15	21	63
Exiting	27	16	20	63
Total	54	31	41	126
Weekday Daily	1,645	431	620	2,696

[1]Automobile Trips in vehicles
[2]Walk/ Bike Trips in persons
[3]Transit Trips in persons

As summarized in Table 5-3, the Project Site was estimated in the FDR to generate approximately 9 automobile trips during the weekday morning peak hour and 54 automobile trips during the weekday evening peak hour. On a daily basis, the Project Site was estimated in the FDR to generate approximately 1,645 automobile trips on a weekday. The site-generated trip tracings associated with the Project Site as outlined in the FDR, which are to be removed from the traffic volume networks are provided in the Appendix.

Mode Share

The Boston Transportation Department (BTD) publishes mode split rates for Jamaica Plain (Area 6) including estimates vehicular, transit, and walking/bicycling mode split rates. As outlined above under Public Transportation Facilities, the Project Site is located within a highly public transportation oriented area of the City with excellent access to an extensive sidewalk system as well as a commuter rail line, subway line, public bus system and school bus service. The pedestrian and walk/bicycle mode share for the Area 6 is summarized in Table 5-4.

As summarized in the Table 5-4, walking/bike trips and transit trips account for approximately half of the trips generated throughout Area 6, thus alternative transportation modes significantly reduce the dependence on automobile trips.

Table 5-4: Mode Share Splits (Area 6)

Period/Direction	Apartments (VOR = 1.13)			Retail (VOR = 1.78)		
	Auto	Walk /Bike	Transit	Auto	Walk /Bike	Transit
Weekday Morning Peak Hour						
Entering	56%	18%	26%	25%	65%	10%
Exiting	44%	12%	44%	25%	65%	20%
Weekday Evening Peak Hour						
Entering	44%	12%	44%	25%	65%	10%
Exiting	56%	18%	26%	25%	65%	10%
Weekday Daily	62%	14%	24%	25%	65%	10%

[1]Mode share assumptions per BTD's mode splits for Jamaica Plain (Area 6).

Trip-generation estimates for the proposed development based on ITE methodology and EEA/MassDOT guidelines were first adjusted for mode share splits provided by BTD for Jamaica Plain. The trip estimates for the retail use were then adjusted to reflect pass-by traffic, which represents the portion of site-generated trips that is drawn from the existing traffic stream and that is not "new" traffic to area roadways. Pass-by data as published by ITE in the *Trip Generation Handbook* indicates an average pass-by rate of 43 for the restaurant use planned for the Project Site. As a conservative measure, no credit or reduction is taken for trips that may be shared between areas complimentary uses; residential and restaurant (internal trips). Trip generation estimates for the proposed uses are summarized in Table 5-5**.**

Table 5-5: Trip-Generation Summary (Autos)

Period/Direction	PROJECTED SITE TRIPS				
	Apartments[1]	Restaurant[2]	Non-Auto Trips[3]	Pass-By[4]	Net New Vehicular Trips
Weekday Morning Peak Hour					
Entering	27	36	-38	-4	**21**
Exiting	106	29	-80	-4	**51**
Total	133	65	-118	-8	**72**
Weekday Evening Peak Hour					
Entering	106	35	-85	-3	**53**
Exiting	57	24	-42	-3	**36**
Total	163	59	-127	-6	**89**
Weekday Daily	1,724	762	-1,226	-82	**1,178**

Source: ITE *Trip Generation*, Ninth Edition; 2009.
[1]Based on ITE LUC 220 (Apartment) trip rates applied to 264 units.
[2]Based on ITE LUC 932 (High-Turnover Sit-Down Restaurant) trip rates applied to 6,000 sf.
[3]Includes walk/ bike trips, transit trips and other trips per BTD's Jamaica Plain Area 6 mode share statistics.
[4]Based on 43% of restaurant trips after reduction for mode share.

As summarized in Table 5-5, the proposed development is estimated to generate approximately 72 new vehicle trips during the weekday morning peak hour (21 entering and 51 exiting) and 89 new vehicle trips during the weekday evening peak hour (53 entering and 36 exiting). On a daily basis, the Project is estimated to generate approximately 1,178 new vehicle trips on a weekday.

The trips summarized in Table 5-5 have been further broken down into automobile, walk/bike, and transit trips using the mode share splits shown in Table 5-4 and vehicle occupancy rates for the various land uses and are summarized in Table 5-6. Detailed trip generation calculations are provided in the Appendix.

Table 5-6: Trip Generation by Mode Share

Period/Direction	Automobile[1]	Walk/Bike[2]	Transit[3]	Total
Weekday Morning Peak Hour				
Entering	25	47	14	86
Exiting	55	47	58	160
Total	80	93	71	246
Weekday Evening Peak Hour				
Entering	56	54	59	169
Exiting	39	38	21	98
Total	95	92	79	267
Weekday Daily	1,260	1,158	598	3,016

[1]Automobile Trips in vehicles
[2]Walk/ Bike Trips in persons
[3]Transit Trips in persons

As summarized in Table 5-6, the Project is estimated to generate approximately 164 new non-automobile trips during the weekday morning peak hour and 171 new non-automobile trips during the weekday evening peak hour. On a daily basis, the development is estimated to generate approximately 1,756 new non-automobile trips on a weekday. With enhancements outlined as part of the Casey Arborway Improvement Project, the expanded pedestrian and bicycle volumes will be adequately accommodated.

Trip Generation Comparison

For comparison purposes, the trip generation for historic (and current) use of the Project Site as a parking lot was also estimated based on turning movement counts collected at the intersection of Washington Street/ Site Driveway in June 2014. Table 5-7 presents a summary and comparison of the site trip generation for both the historical and proposed use of the Project Site.

Table 5-7 Trip-Generation Comparison

Period/Direction	Site Trips - Vehicular		Difference
	Historical Parking Lot Use[1] (306± Spaces)	Proposed Mixed-Use[2]	
Weekday Morning Peak Hour:			
Entering	128	25	-103
Exiting	11	55	+44
Total	139	80	-59
Weekday Evening Peak Hour:			
Entering	40	56	+16
Exiting	113	39	-74
Total	153	95	-58

[1]Based on TMC's at the Washington Street/Site Driveway intersection on October 22, 2015.
[2]Automobile trips as shown in Table 5-5.

As summarized in Table 5-7, when compared to existing parking lot use of the Project SIte, the Project is expected to generate approximately 60 fewer vehicle trips during peak hours. As shown the Project will result in a decrease in vehicular trips on the area roadway networks compared to a No-Build condition.

5.3.2 TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of development-generated trips on the roadway network is a function of a number of variables including area population centers and the efficiency of these roadways leading to the Project Site. The trip distribution pattern used for the Project Site is based on existing travel patterns and Census 2010 Journey to Work data and is summarized in Figure 5-9 and Figure 5-10.

Development-related trips for the Project Site were assigned to the roadway network using the ITE trip-generation estimates shown in Table 5-4. New development-related trips at each intersection for the weekday morning, weekday evening, and Saturday midday peak hours are quantified in Figure 5-9 and Figure 5-10.

5.3.3 BUILD TRAFFIC VOLUMES

Future 2035 Build condition traffic volumes were arrived at by first removing trips assumed for the Project Site redevelopment as part of the Casey Arborway FDR from the 2035 Baseline traffic volume networks, then estimating the number of peak-hour trips expected to be generated by the proposed development and finally adding the site-generated traffic onto 2035 Baseline traffic volume networks based on the projected distribution pattern. The 2035 Build condition traffic-volume networks for the weekday morning and weekday evening peak hours are displayed in Figure 5-11 and Figure 5-12.

5.4 TRAFFIC OPERATIONS ANALYSIS

Intersection capacity analyses for the primary study intersections are presented in this section for the Baseline and Build traffic-volume conditions. Capacity analyses, conducted in accordance with BTD and EEA/MassDOT guidelines, provide an index of how well the roadway facilities serve the traffic demands placed upon them. The operational results provide the basis for recommended access and roadway improvements in the following section if required.

5.4.1 CAPACITY ANALYSIS PROCEDURES

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the 2010 Highway Capacity Manual (HCM). The resulting analysis presents a level-of-service (LOS) designation for individual intersection movements. The LOS is a letter designation that provides a qualitative measure of operating conditions based on several factors including roadway geometry, speeds, ambient traffic volumes, traffic controls, and driver characteristics. Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of LOS, depending on the time of day, day of week, or period of year. A range of six levels of service are defined on the basis of average delay, ranging from LOS A (the least delay) to LOS F (delays greater than 50 seconds for unsignalized movements and 80 seconds for signalized movements). The specific control delays and associated LOS designations are presented in the Appendix.

5.4.2 INTERSECTION CAPACITY ANALYSIS RESULTS

Capacity analysis results for the weekday morning and weekday evening peak hour capacity analysis results for the study intersections are described below, with detailed analysis results presented in the Appendix.

The capacity analysis results for the intersections in the study area are summarized in Table 5-8 and Table 5-9 for the weekday morning and weekday evening peak hours, respectively. Detailed analysis results are presented in the Appendix.

Table 5-8 Intersection Capacity Analysis Results Weekday Morning Peak Hour

Intersection	Approach	2035 Baseline			2035 Build		
		v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS
1 – Washington St	Westbound	0.01	< 5	A	0.10	< 5	A
at Site Driveway/	Northbound	0.86	44	D	0.86	44	D
MBTA Bus Entrance	Southbound	0.30	7	A	0.32	7	A
	Overall	**0.86**	**30**	**C**	**0.86**	**29**	**C**
2 – Washington St	Eastbound	0.72	14	B	0.72	14	B
at Arborway	Westbound	0.87	40	D	0.87	43	D
	Northbound	0.74	8	A	0.77	10	A
	Southbound	0.58	40	D	0.71	43	D
	Overall	**0.87**	**26**	**C**	**0.87**	**28**	**C**
3 - South St	Eastbound	0.54	19	B	0.54	19	B
at Arborway	Westbound	0.97	37	D	0.97	39	D
	Northbound	0.90	45	D	0.90	45	D
	Southbound	0.81	38	D	0.81	38	D
	Overall	**0.97**	**33**	**C**	**0.97**	**34**	**C**
4 – Arborway	Eastbound	0.50	19	B	0.50	19	B
at Westbound U-Turn	Westbound	0.59	6	A	0.60	6	A
	Overall	**0.59**	**11**	**B**	**0.60**	**11**	**B**
5 – Arborway	Eastbound	0.52	9	A	0.51	9	A
At Eastbound U-Turn	Westbound	0.66	18	B	0.67	18	B
	Overall	**0.66**	**14**	**B**	**0.67**	**14**	**B**

[1]Volume-to-capacity ratio
[2]Average control delay per vehicle (in seconds)
[3]Level of service

Table 5-9: Intersection Capacity Analysis Results Weekday Evening Peak Hour

Intersection	Approach	2035 Baseline			2035 Build		
		v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS
1 – Washington St	Westbound	0.06	< 5	A	0.08	< 5	A
at Site Driveway/	Northbound	0.82	41	D	0.82	41	D
MBTA Bus Entrance	Southbound	0.54	9	A	0.61	12	B
	Overall	**0.82**	**23**	**C**	**0.82**	**24**	**C**
2 – Washington St	Eastbound	> 1.0	77	E	> 1.0	77	E
at Arborway	Westbound	0.71	12	B	0.71	12	B
	Northbound	0.93	16	B	0.93	16	B
	Southbound	> 1.0	> 80	F	> 1.0	> 80	F
	Overall	**> 1.0**	**59**	**E**	**> 1.0**	**59**	**E**
3 - South St	Eastbound	0.69	22	C	0.69	22	C
at Arborway	Westbound	0.68	21	C	0.69	21	C
	Northbound	0.90	49	D	0.90	49	D
	Southbound	0.70	45	D	0.69	45	D
	Overall	**0.90**	**27**	**C**	**0.90**	**27**	**C**
4 – Arborway	Eastbound	0.84	32	C	0.85	32	C
at Westbound U-Turn	Westbound	0.80	17	B	0.81	17	B
	Overall	**0.84**	**25**	**C**	**0.85**	**25**	**C**
5 – Arborway	Eastbound	0.48	7	A	0.48	7	A
At Eastbound U-Turn	Westbound	0.59	19	B	0.59	19	B
	Overall	**0.59**	**12**	**B**	**0.59**	**12**	**B**

[1]Volume-to-capacity ratio
[2]Average control delay per vehicle (in seconds)
[3]Level of service

Summary of Traffic Operations Analysis

Under 2035 Build conditions, the study intersections will generally continue to operate at the same overall level of service (LOS) as under 2035 Baseline conditions. Key findings of capacity analysis presented in Table 5-8 and Table 5-9 are as follows:

1. *Washington Street at Site Driveway/MBTA Bus Entrance:* Traffic operations at this signalized intersection are LOS C during peak hours on weekdays under all analysis periods with no material change in intersections delays due to Project-related traffic (slight reduction in delay).

2. *Washington Street at Arborway:* Traffic operations at this signalized intersection will operate at LOS C or better during the weekday morning peak hour and LOS E or better during the weekday evening peak hour. There is no material change in intersections delays due to Project-related traffic (1-second delay increase or less overall).

3. *South Street at Arborway:* Under Build conditions, traffic operations at this signalized intersection will remain at LOS C or better during peak hours on weekdays. There is no material change in intersections delays due to Project-related traffic (1-second delay increase or less overall).

4. *Arborway at Westbound U-Turn:* Traffic operations at this signalized intersection will continue to operate at LOS C or better with the Project in place. There is no material change in intersections delays due to Project-related traffic (1-second delay increase or less overall).

5. *Arborway at Eastbound U-Turn:* Traffic operations at this signalized intersection will continue to operate at LOS B or better with the project in place. There is no material change in intersections delays due to Project-related traffic.

5.4.3 VEHICLE QUEUE ANALYSIS RESULTS

Vehicle queue results are presented for the signalized study intersections. These vehicle queues are compared to available storage lengths, which are defined as lengths of exclusive turn lanes or the distance to the nearest major intersection for through lanes. Vehicle queue results from the capacity analysis are summarized in Table 5-10 and Table 5-11. Detailed worksheets of the queuing analysis are provided in the Appendix.

As presented in Table 5-10 and Table 5-11, under Baseline conditions the average and 95th percentile vehicle queues at the signalized study intersections are generally contained within available storage lanes during the weekday morning, and weekday evening peak hours. Under Build condition, the mixed-use development generally results in similar vehicle queues compared to Baseline conditions with queue increases generally within one vehicle length or less.

Table 5-10: **Vehicle Queue Analysis Summary Weekday Morning Peak Hour**

Approach	Storage Length (feet)	2035 Baseline		2035 Build	
		Average Queue Length	95th Percentile Queue Length[1]	Average Queue Length	95th Percentile Queue Length
1-Washington Street at Site Driveway/ MBTA Bus Entrance					
Westbound L/R	200±	<25	<25	<25	<25
Northbound L/T & T/R	450±	376	470	376	469
Southbound L/T & T/R	160±	75	86	77	89
2- Washington Street at Arborway					
Eastbound T & T/R	520±	151	208	149	205
Westbound L	200±	<25	<25	<25	<25
Westbound T & T/R	650±	441	579	443	580
Northbound L	160±	<25	<25	<25	<25
Northbound T & T/R	160±	<25	<25	26	67
Southbound L	150±	40	100	49	132
Southbound T & T/R	>1000	164	223	166	224
3-Arborway at South Street					
Eastbound T	700±	257	303	260	306
Eastbound R	400±	<25	57	<25	57
Westbound T & T/R	525±	632	741	666	751
Northbound L	300±	161	237	161	237
Northbound T & T/R	325±	384	478	385	478
Southbound L	100±	44	125	44	125
Southbound T/R	100±	77	112	77	112
4- Arborway at Westbound U-Turn					
Eastbound T	>1000	235	276	236	278
Westbound U-Turn	400±	240	345	244	350
Westbound T	700±	<25	<25	<25	<25
5- Arborway at Eastbound U-Turn					
Eastbound U-Turn	>1000	192	236	191	234
Eastbound T	700±	<25	<25	<25	<25
Westbound T	>1000	374	493	376	494

[1] Average and 95th percentile queue lengths are reported in feet per lane.

Table 5-11: Vehicle Queue Analysis Summary Weekday Evening Peak Hour

Approach	Storage Length (feet)	2035 Baseline		2035 Build	
		Average Queue Length	95th Percentile Queue Length[1]	Average Queue Length	95th Percentile Queue Length
1-Washington Street at Site Driveway/ MBTA Bus Entrance					
Westbound L/R	200±	<25	<25	<25	<25
Northbound L/T & T/R	450±	342	430	338	426
Southbound L/T & T/R	160±	136	131	151	136
2- Washington Street at Arborway					
Eastbound T & T/R	520±	116	903	115	910
Westbound L	200±	<25	<25	<25	<25
Westbound T & T/R	650±	139	153	138	152
Northbound L	160±	54	94	54	95
Northbound T & T/R	160±	<25	<25	<25	<25
Southbound L	150±	56	126	81	187
Southbound T & T/R	>1000	523	660	518	654
3-Arborway at South Street					
Eastbound T	700±	373	439	377	442
Eastbound R	400±	198	310	200	306
Westbound T & T/R	525±	278	371	287	379
Northbound L	300±	121	170	121	170
Northbound T & T/R	325±	214	261	214	260
Southbound L	100±	72	115	70	109
Southbound T/R	100±	154	193	156	194
4- Arborway at Westbound U-Turn					
Eastbound T	>1000	512	583	516	588
Westbound U-Turn	400±	442	622	448	630
Westbound T	700±	<25	<25	<25	<25
5- Arborway at Eastbound U-Turn					
Eastbound U-Turn	>1000	234	246	235	243
Eastbound T	700±	<25	191	<25	181
Westbound T	>1000	283	327	285	330

[1] Average and 95th percentile queue lengths are reported in feet per lane.

5.5 PARKING

This section identifies the parking supply and demand relationships for a study within ¼ mile of the Project Site. This section also contains a project-related parking demand analysis. This analysis is based upon the uses proposed and non-auto mode shares for the Jamaica Plain "Area 6" as documented under *Trip Generation*. The analysis also incorporates a "shared parking" concept based up on the Urban Land Institute (ULI) methodology. The evaluation was conducted in accordance with BTD's Transportation Access Plan Guidelines.

5.5.1 EXISTING AREA PARKING SUPPLY

The existing public parking supply within ¼ mile of the Project Site and on-site includes 1,275± parking spaces. The study area is shown in Figure 5-13 that was color-coded based on parking type with detailed data sheets included in the Appendix and included the following parking space breakdown:

- LAZ Parking Lot (Site) – 306± spaces
  The existing parking lot is a private off-street lot that provides parking for commuters and area businesses for a fee. The parking lot has direct access to a signalized intersection along Washington Street opposite the MBTA bus entrance.

- Forest Hills MBTA Lots – 242± spaces
  The existing Forest Hill Station parking lot is a public off-street lot that provides parking primarily for commuters for a fee. The parking lots have direct access to Washington Street and Hyde Park Avenue.

- Public On-Street Parking - 727± spaces
  The public on-street parking supply within ¼ mile of the Project Site includes 103 time-limit restricted spaces (2 hour parking limit), 465 resident-only parking spaces (resident permit required), and 159 unregulated spaces as summarized in Table 5-12.

Table 5-12: On-Street Parking Supply – ¼ ± Mile Radius

	Parking Supply[1,2,3]		
Location	**2 Hour Parking**	**Resident Permit Only Parking**	**Unrestricted Parking[2]**
Hyde Park Avenue	32	<17>	-
Wenham Street	2	<40 (1)>	[96]
Weld Street	-	<58>	-
Woodlawn Street	1	<79 (1)>	-
Tower Street	-	<76>	-
Morton Street	47	<3>	-
Arborway (East)	-	<28>	-
Asticou Road	2	<36>	-
St. Mark Street	-	<7>	-
Spaulding Street/ Rosemary St Loop	12	<64>	-
Hampstead Road	3	<55>	-
Washington Street	4	-	[1]
Anson Street	-	-	[55 (1)]
Orchardhill Road	-	-	[30]
South Street	-	-	[51]
Arborway (West)	-	-	[21]
Total	**103**	**<463 (2)>**	**[158 (1)]**

[1] (#) = Handicapped Parking Space

[2] [#] = Unrestricted Parking Space

[3] <#> = Resident Permit Parking Space

5.5.2 observed peak parking demand

An on-street parking accumulation survey was conducted to identify parking trends within a ¼± mile radius of the Project Site on Tuesday, October 10, 2015. The inventory included parking observations of the weekday midday parking demand (12:00 PM) which is summarized in Table 5-13.

Table 5-13: On-Street Parking Demand – Weekday Midday (12:00 PM) – ¼± Mile Radius

	Observed Parking Demand[1,2,3]		
Roadway	**Occupied Spaces**	**Total**	**Percent Occupied**
Hyde Park Avenue	32<17>	49	100%
Wenham Street	2<30>	32	23%
Weld Street	<45>	45	78%
Woodlawn Street	1<43>	44	54%
Tower Street	<32>	32	42%
Morton Street	17<2>	19	38%
Arborway (East)	<28>	28	100%
Asticou Road	2<14>	16	74%
St. Mark Street	<7>	7	100%
Spaulding Street/ Rosemary St Loop	12<38>	50	66%
Hampstead Road	3<20>	23	40%
Washington Street	4[1]	5	100%
Anson Street	[33]	33	58%
Orchardhill Road	[12]	12	40%
South Street	[51]	51	100%
Arborway (West)	[21]	21	100%
Total	**73<276>[118]**	**467**	**64%**

[1] (#) = Handicapped Parking Space
[2] [#] = Unrestricted Parking Space
[3] <#> = Resident Permit Parking Space

Key findings of the area parking surveys are as follows:

- *LAZ Parking Lot (Site)*. The LAZ lot was observed to have a midday demand of 298 during a weekday. The resulting parking utilization is approximately 37% resulting in a reserve parking supply of approximately six spaces.

- *Forest Hills MBTA Lots*. The Forest Hills MBTA lots were observed to have a midday demand of 186 during a weekday. The resulting parking utilization is approximately 77% resulting in a reserve parking supply of approximately 56 spaces.

- *On-Street Parking – Weekday Midday (12:00 pm) Parking Demand*. The parking demand during the weekday midday period was observed to be 476 spaces. The resulting parking utilization is approximately 64% resulting in a reserve supply of at least 260 vacant spaces (including 30 time-restricted spaces), 189 resident spaces, and 41 unregulated spaces.

In summary, the total supply of public parking located within a ¼ mile of the Project Site accommodates existing parking needs of the abutting neighborhood and Forest Hills Station.

5.5.3 PROPOSED PARKING SUPPLY

The Project Site will be re-developed to include a total supply of 151± parking spaces consisting of 15± surface parking spaces and 136± garage parking spaces providing an effective parking ratio of 0.6 spaces per unit.

The parking allocation of parking to the residential component of the Project Site will be available to residents for a fee and will be located primarily within the parking garage with shared parking in the surface parking areas. Commercial parking spaces will be located within the 15 space shared surface parking areas. The commercial space is being design as accessory retail and will be designed to complement the areas residential, commercial, and institutional uses and thus is expected to result in a negligible increase in parking demand for the neighborhood.

The parking supply is designed to be 0.6 spaces per unit, which complies with the City's parking goal of between 0.2 and 1.5 spaces per unit for the Jamaica Plain neighborhood as outline in BTD's *Parking Boston*. The overall parking supply will require residents and patrons to utilize alternative trip generation methods including the extensive public transportation system, proposed bike routes, and sidewalk system in the immediate area.

5.6 RECOMMENDATIONS

Access improvements that support projected traffic associated with the proposed development are identified that minimize or offset Project-related traffic impacts and address access needs for the Project Site. The Proponent will continue to work with the City of Boston (BTD) to create a project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use. The Proponent is responsible for the preparation of the Transportation Access Plan Agreement (TAPA), a formal legal agreement between the Proponent and the BTD. The TAPA formalizes the findings of the transportation study, mitigation commitments, elements of access and physical design, travel demand management measures, and any other responsibilities that are agreed to by both the Proponent and the BTD. Since the TAPA must incorporate the results of the technical analysis, it must be executed after these other processes have been completed. The proposed measures listed below and any additional transportation improvements to be undertaken as part of this Project will be defined and documented in the TAPA.

Recommended improvements include (a) access-related improvements, (b) pedestrian improvements, and (c) transportation demand management (TDM). The Proponent will also produce a Construction Management Plan (CMP) for review and approval by BTD. The CMP will detail the schedule, staging, parking, delivery, and other associated impacts of the construction of the Project.

5.6.1 ACCESS AND CIRCULATION IMPROVEMENTS

The Proponent sponsored and MDM recommended access-related improvements aimed at enhancing traffic operations and/or travel safety including the following:

- *Signage and Pavement Markings*. STOP line pavement markings are recommended on the driveway approaches to Washington Street. The signs and pavement markings shall be compliant with the Manual on Uniform Traffic Control Devices (MUTCD).

- *Sight Lines*. Plantings (shrubs, bushes) and structures (walls, fences, etc.) should be maintained at a height of 2 feet or less within the sight lines in vicinity of the Project Site's external and internal intersections to provide unobstructed sight lines. Furthermore, the existing vegetation and structures within the sight lines should be cleared when the new roadways are constructed and the terrain shall be graded as required to ensure minimum recommended sight line requirements are met or exceeded.

- *Loading and Service Activity*. On-site loading and service areas will occur on-site in designated loading zones. AutoTurn® outlining the proposed delivery vehicle circulation patterns is provided in the Appendix. Trash and recycle in operations will also occur curbside using roll-out dumpsters. The majority if not all of the truck trips are expected to occur during off-peak hours and the proposed loading areas will be sufficient to handle the loading demands of the Project.

5.6.2 PEDESTRIAN IMPROVEMENTS

Sidewalks and ADA compliant crosswalks are recommended where feasible to connect the Project Site and adjacent properties and roadways to accommodate and promote pedestrian activity. The site plan envisions an extensive system of interconnected walkways that achieve this objective, including connections to the sidewalk and bicycle systems along Washington Street, Arborway, and the Frontage Road.

5.6.3 TRANSPORTATION DEMAND MANAGEMENT

The Proponent is committed to reduce auto dependency by employees, patrons and residents by implementing a robust TDM program. These elements are also consistent with the Massachusetts Department of Environmental Protection (MADEP) directive to use all reasonable and feasible mitigation actions to reduce auto emissions. It should be noted that the mixed-use nature and location immediately adjacent to the multi-modal Forest Hill Station (bus, subway and commuter train terminal).

A preliminary list of potential TDM program elements may include the following:

- *On-Site Employee Transportation Coordinator*. The Proponent will require that each tenant designate an on-site employee transportation coordinator. The employee transportation coordinator will be responsible for disseminating relevant TDM information to employees including posting TDM information at appropriate locations within the buildings and on relevant webpages.

- *MassRIDES*. MassRIDES is the Executive Office of Transportation's statewide travel options program providing free assistance to commuters, employers, students, and other traveler markets. MassRIDES programs may encourage workers to use alternative forms of transportation such as carpooling, vanpooling, and to utilize a large database for rideshare matching. The Proponent will promote commuter assistance programs available through MassRIDES by encouraging tenants to incorporate information on MassRIDES as part of the employee orientation programs. MassRIDES information will also be posted in each residential building.

- *Public Transportation Information & Promotion*. Posting of service and schedule information for employees, patrons and residents, on-site sale of transit passes to promote the use of public transportation by employees, patrons, and residents.

- *Bicycle Facilities & Promotion*. In accordance with BTD guidelines, bicycle racks will be provided on-site in close proximity to the building entrances for use by employees, patrons, and residents. Including one covered resident space per unit and exterior racks. The location and number of racks will be identified more specifically during the local site plan review and approval process. Additionally, the on-site transportation coordinator can disseminate maps of on-site bicycle storage locations and maps of area bicycle routes. A bicycle-sharing program to promote the use of bicycles as an alternative commuting method will also be evaluated.

- *Pedestrian Infrastructure/Walking Incentives*. The proposed site layout will include additional sidewalks and/or designated pathways to proposed buildings that connect to the existing sidewalk system along Washington Street, Arborway, and the Frontage Road. The Proponent will install sidewalks with connections to adjacent roadways to encourage walking on-site and to and from the Project Site from the residential and commercial properties in the area as well as the nearby MBTA station.

- *Tenant Manual for Employee Services*. The Proponent will be leasing retail space and thus there are a number of TDMs that can only be implemented by the tenant-employers. The Proponent will prepare a Tenant Manual that will encourage tenant-employers to offer their employees: 1) direct deposit of paychecks; 2) alternative work schedules to reduce peak hour traffic volumes; 3) transit pass subsidies; and 4) a guaranteed ride home program for employees who van/carpool.

- *Electric Vehicle Charging Stations and Preferential Parking for Low-Emission Vehicles*. Preferential parking locations for those who use low-emission vehicles will be provided on-site and electric vehicle charging stations will be provided.

- *Vehicle Sharing Services*. The proponent will provide zip-car spaces on-site to provide shared vehicle service for on-site employees, patrons, and residents as well as to the local neighborhood. The number of shared vehicle spaces will be monitored and adjusted as needed to meet demands.

- *No Idling Signage*. Installation of "No Idling" signs at the Project Site's commercial vehicle parking areas to reduce the amount of greenhouse gasses emitted.

5.6.4 CONSTRUCTION MANAGEMENT PLAN

Details of the overall construction schedule, working hours, number of construction workers, worker transportation, and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan (CMP) to be filed with BTD in accordance with the City's transportation maintenance plan requirements. The CMP will also address the need for pedestrian detours, lane closures, and/or parking restrictions, if necessary to accommodate a safe and secure work zone.

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

- Construction workers will be encouraged to use public transportation and/or carpool;
- A subsidy for MBTA passes will be considered for full-time employees; and
- Secure spaces will be provided on-site for workers' supplies and tools so they do not need to be brought to the Project Site each day.

The CMP will be executed with BTD prior to commencement of construction and will document all committed measures.

Figure 5-1
Site Location
Source: MDM Transportation Associates, Inc., 2016

Figure 5-2
Preliminary Site Layout
Source: ICON Architecture, 2016

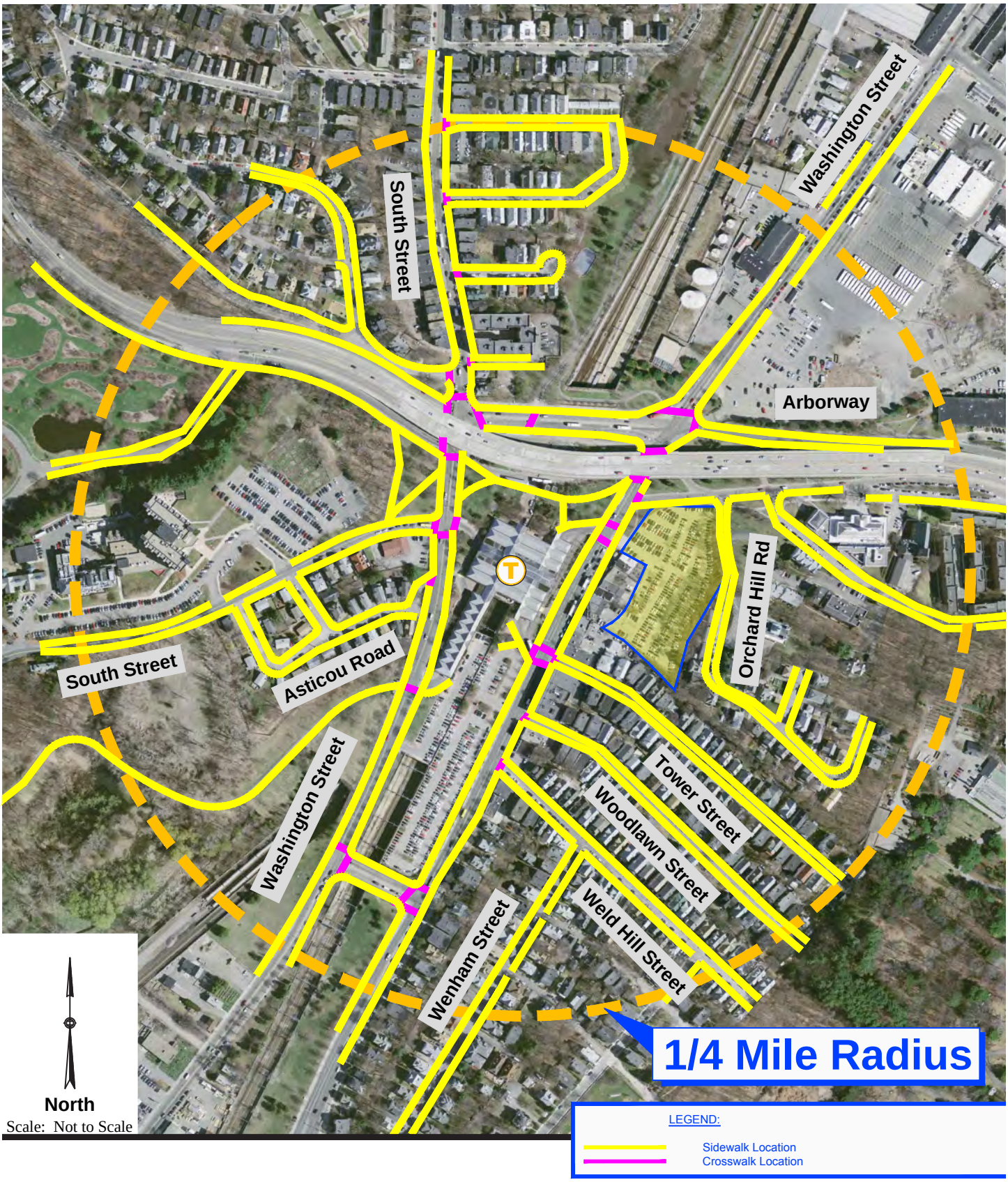


Figure 5-3
Sidewalk and Crosswalk Locations
Source: MDM Transportation Associates, Inc., 2016

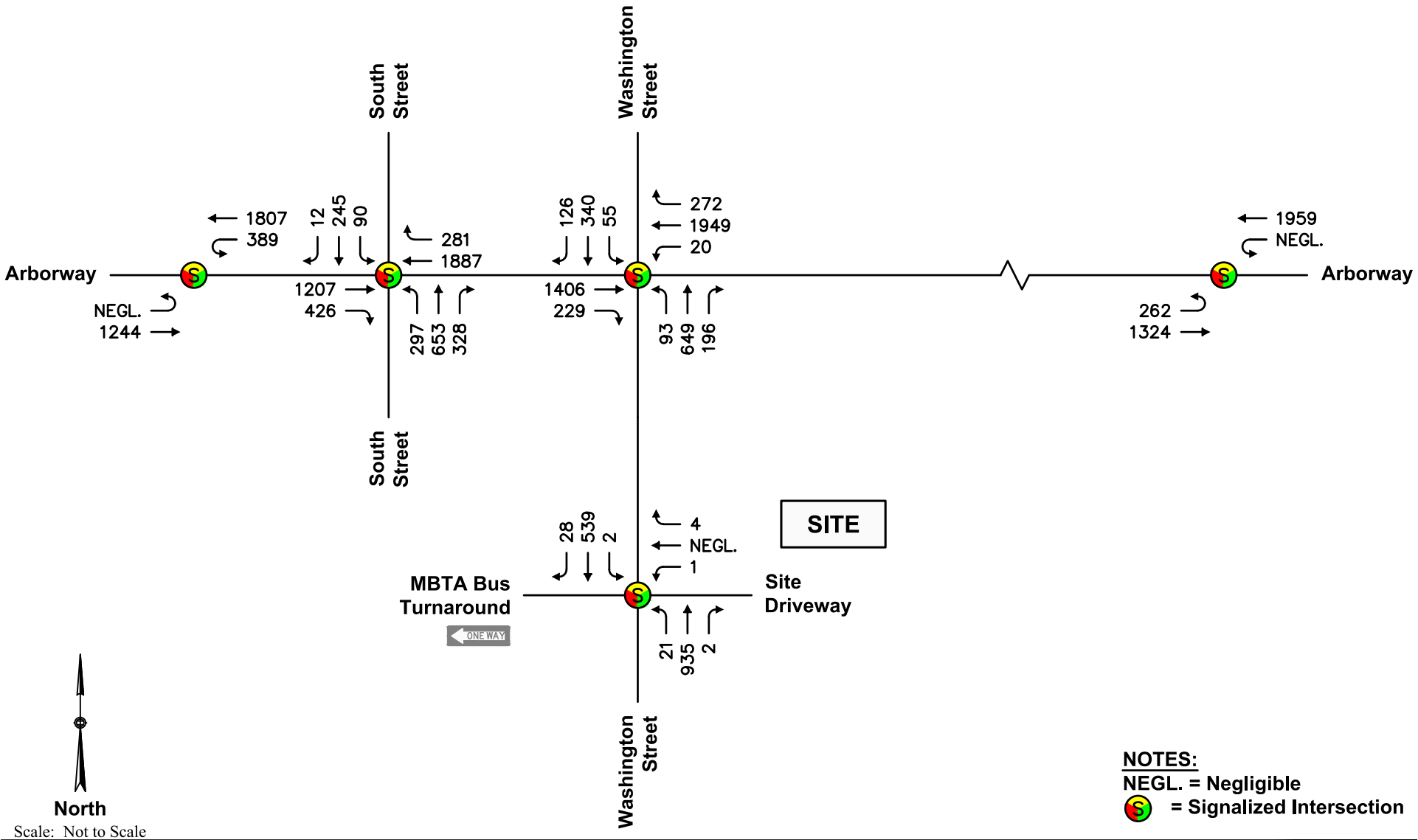


Figure 5-4

2035 Baseline Conditions- Weekday Morning Peak Hour Traffic Volume

Source: MDM Transportation Associates, Inc., 2016

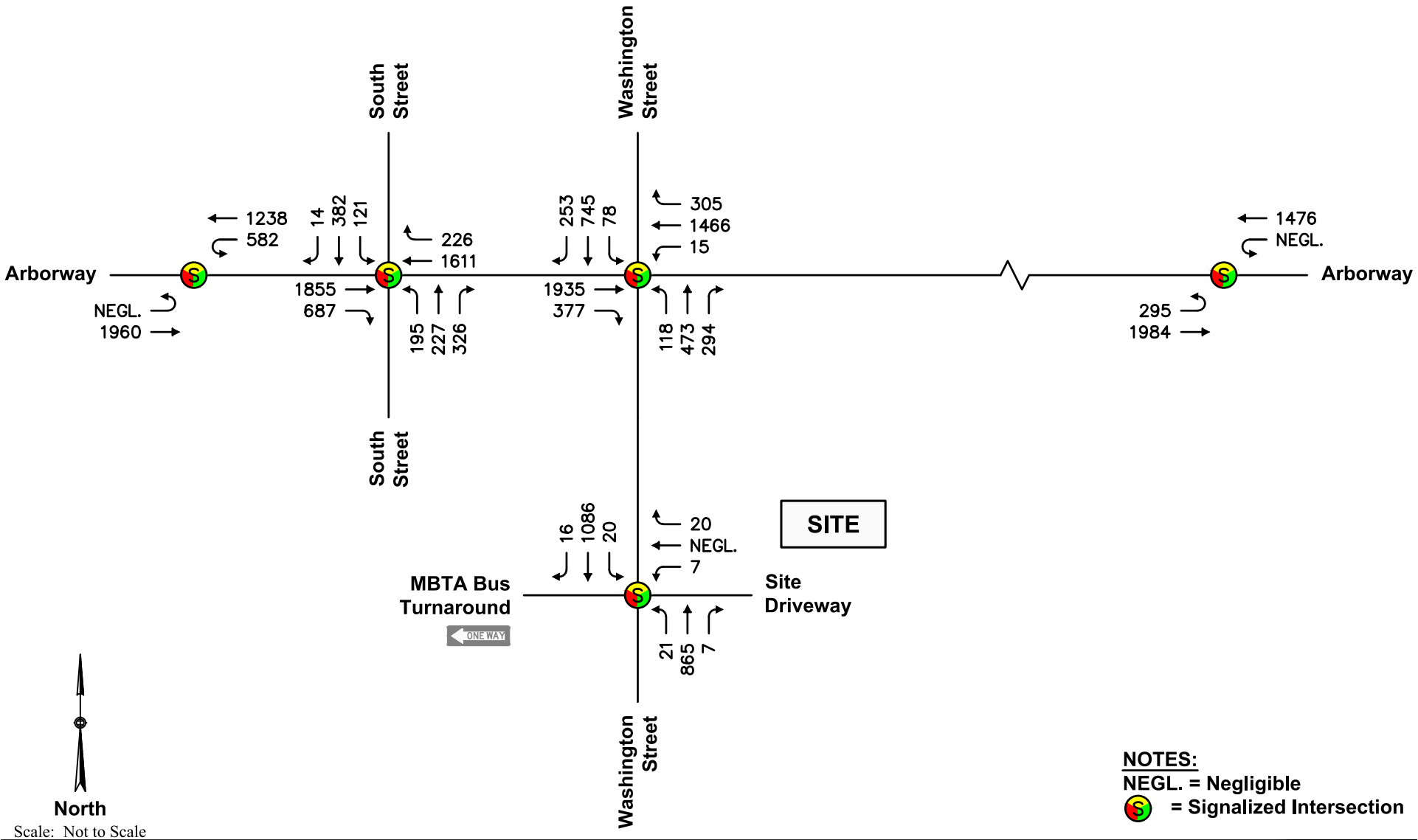


Figure 5-5

2035 Baseline Conditions- Weekday Evening Peak Hour Traffic Volume

Source: MDM Transportation Associates, Inc., 2016

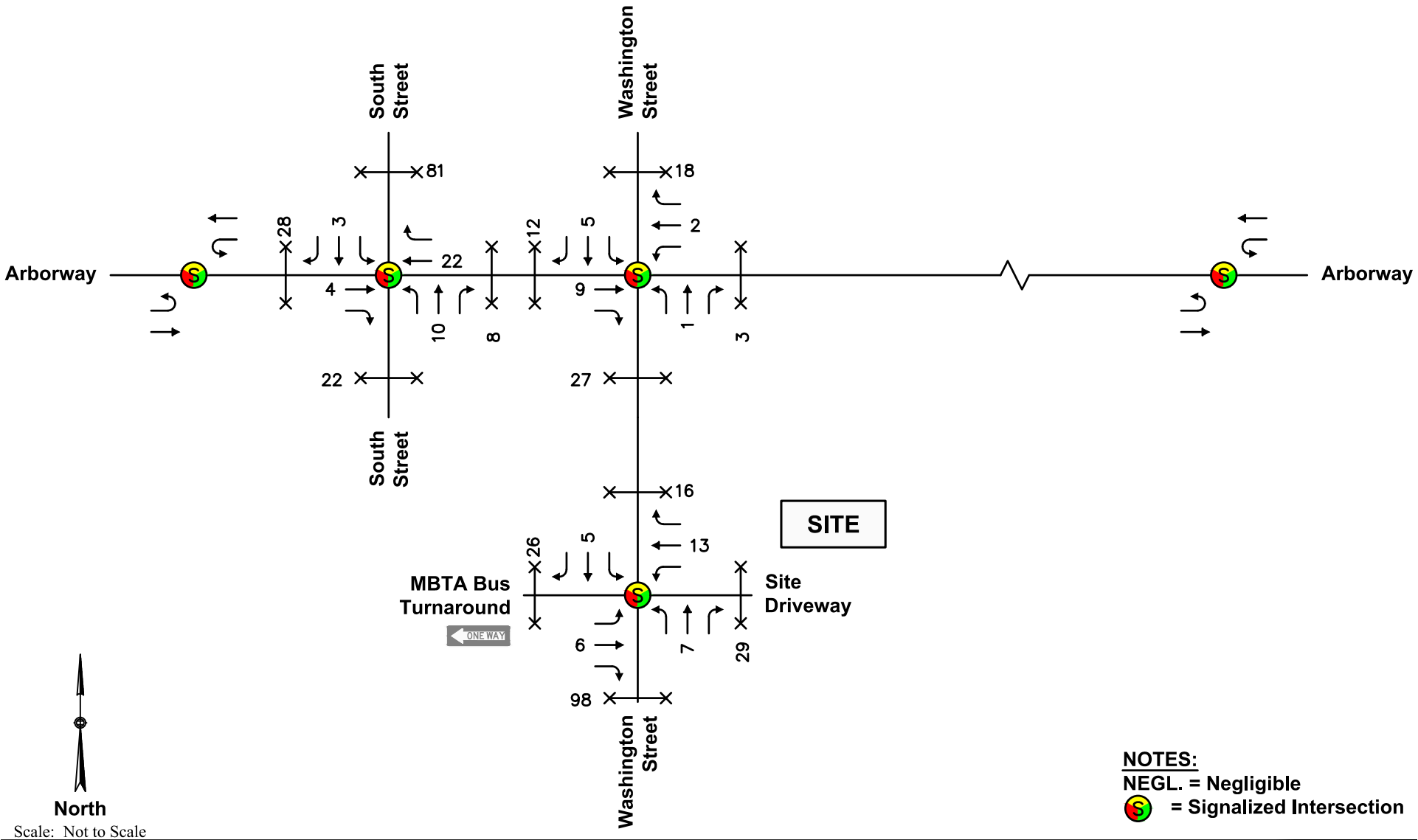


Figure 5-6

2035 Baseline Conditions- Weekday Morning Peak Hour Pedestrian & Bicycle Volume

Source: MDM Transportation Associates, Inc., 2016

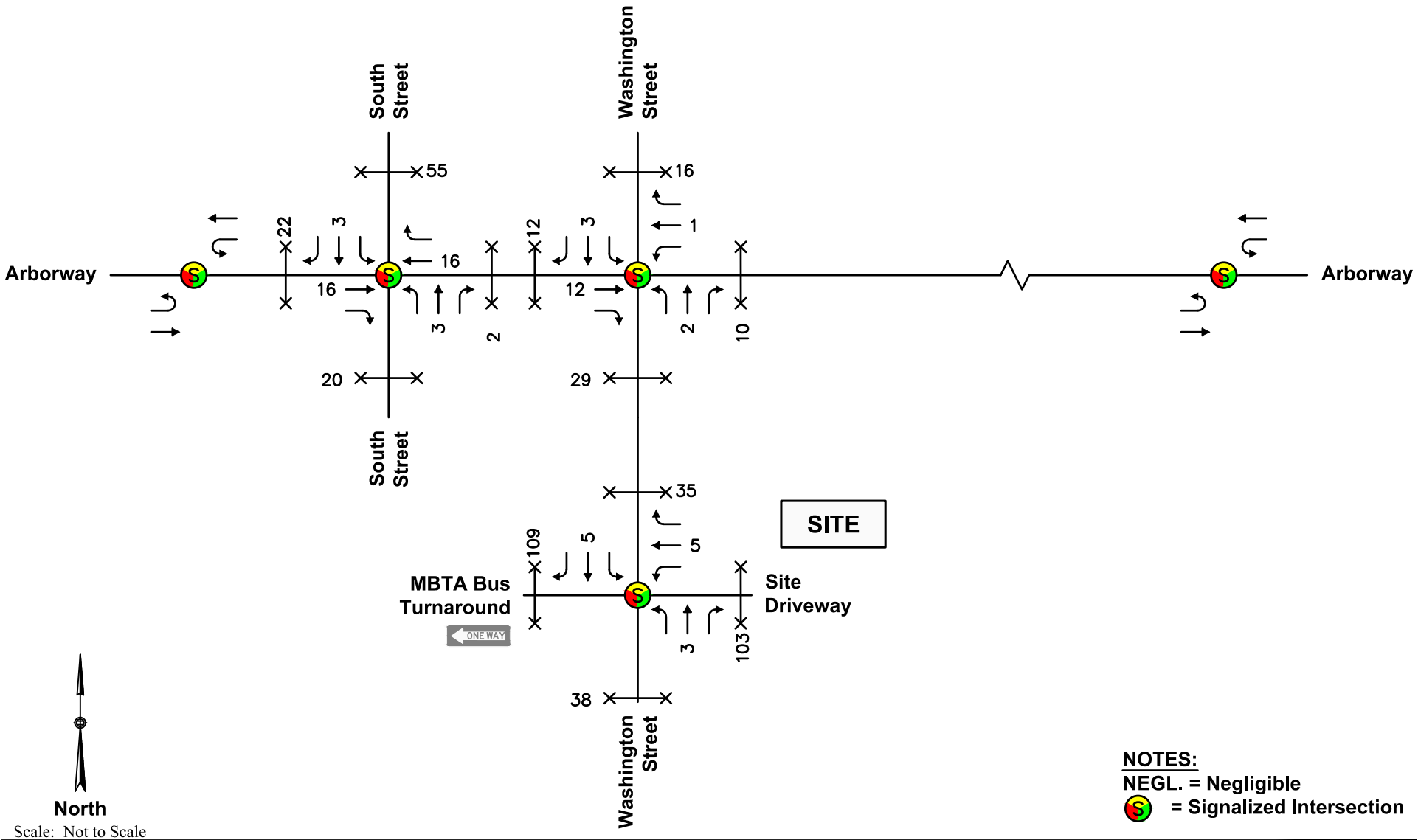


Figure 5-7

2035 Baseline Conditions- Weekday Evening Peak Hour Pedestrian & Bicycle Volumes

Source: MDM Transportation Associates, Inc., 2016

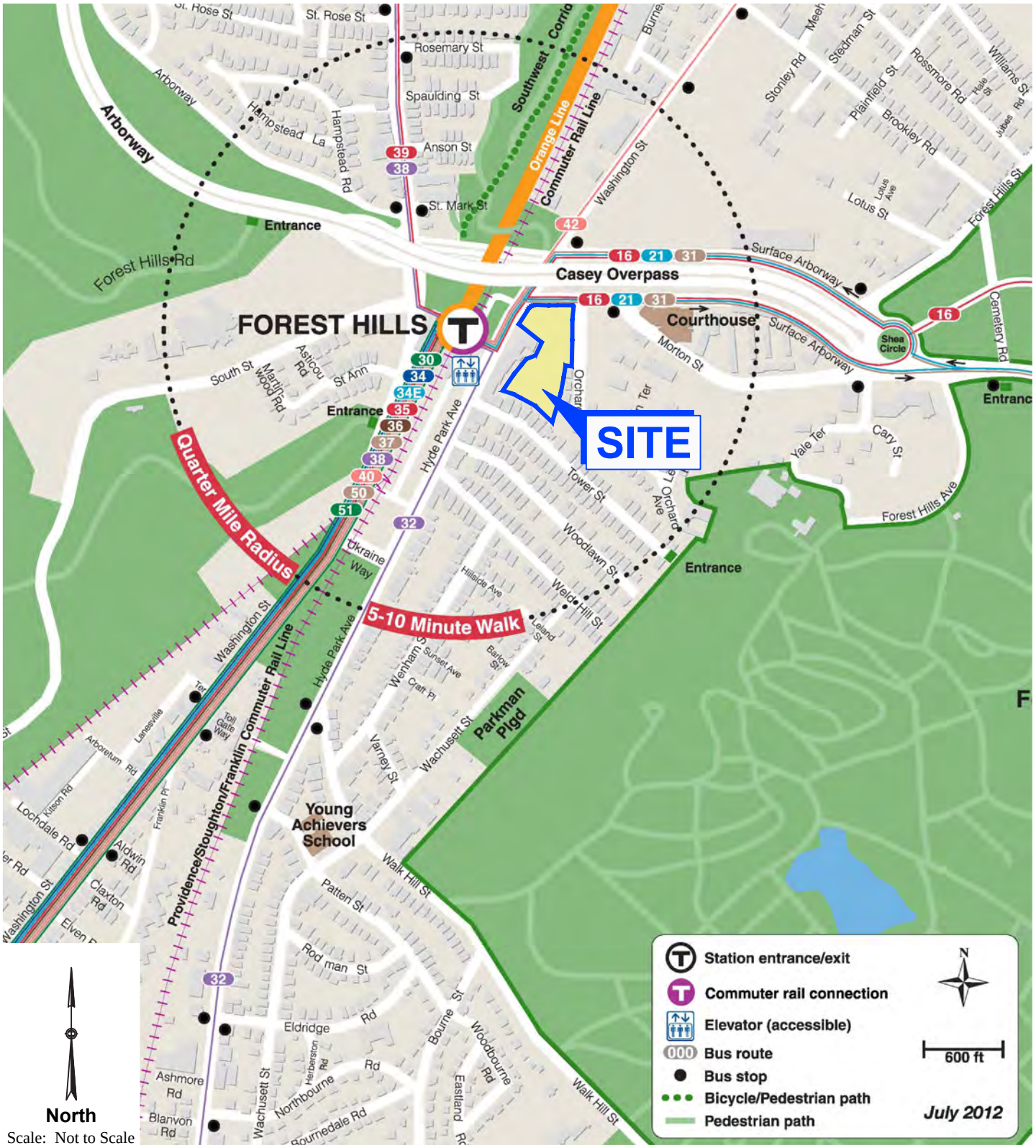


Figure 5-8
MBTA Map
Source: MDM Transportation Associates, Inc., 2016

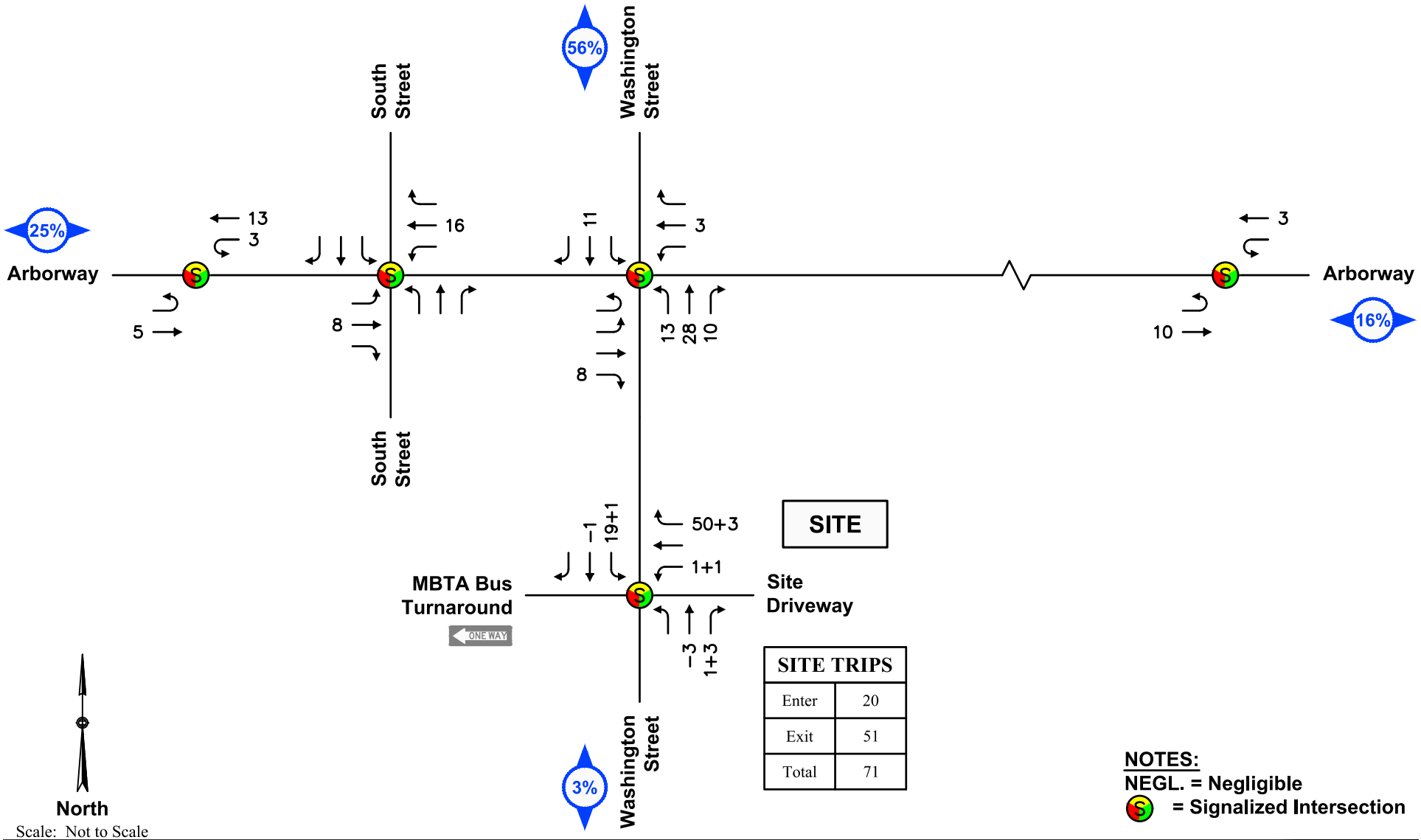


Figure 5-9

Site Generated Trips Weekday Morning Peak Hour

Source: MDM Transportation Associates, Inc., 2016

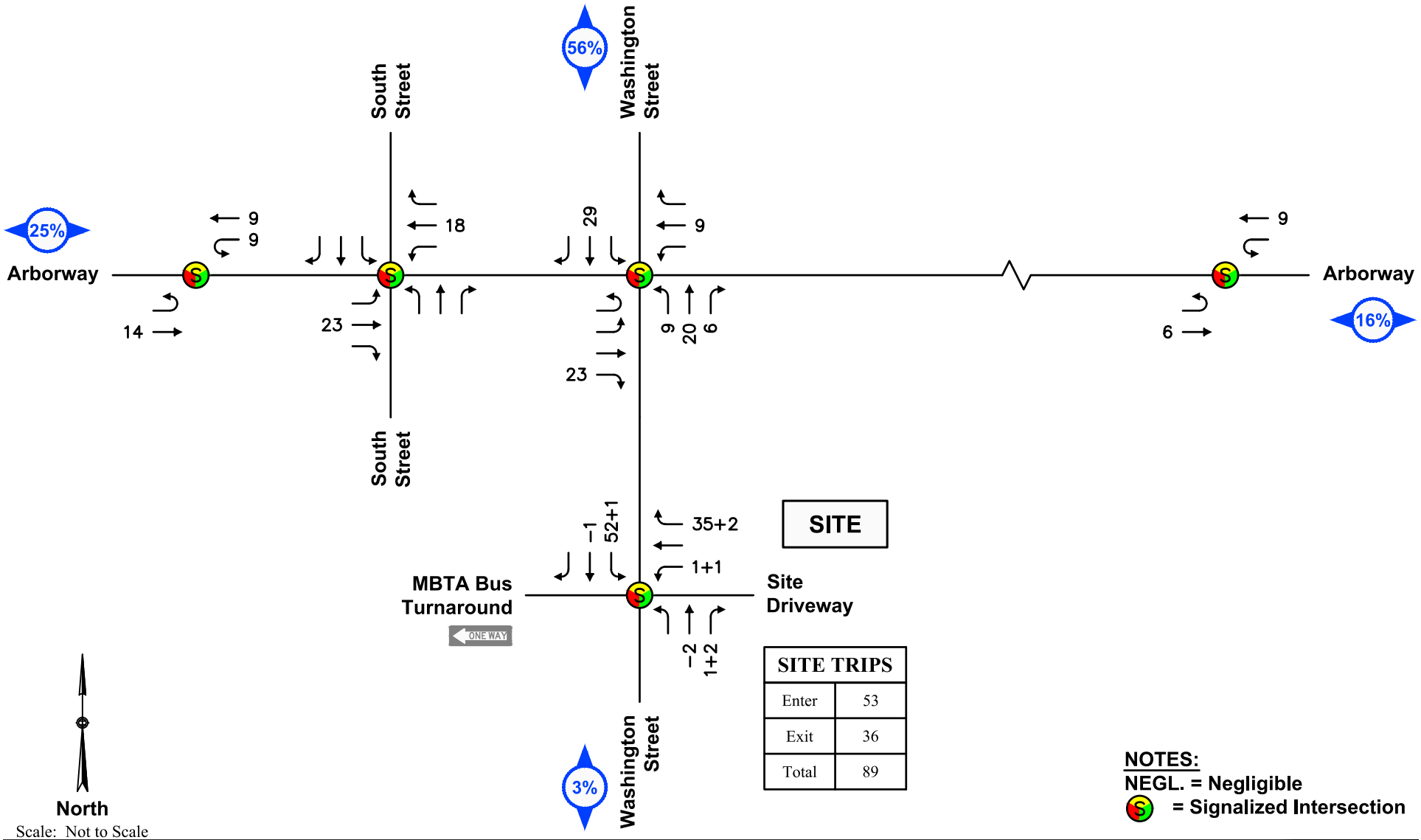


Figure 5-10
Site Generated Trips Weekday Evening Peak Hour
Source: MDM Transportation Associates, Inc., 2016

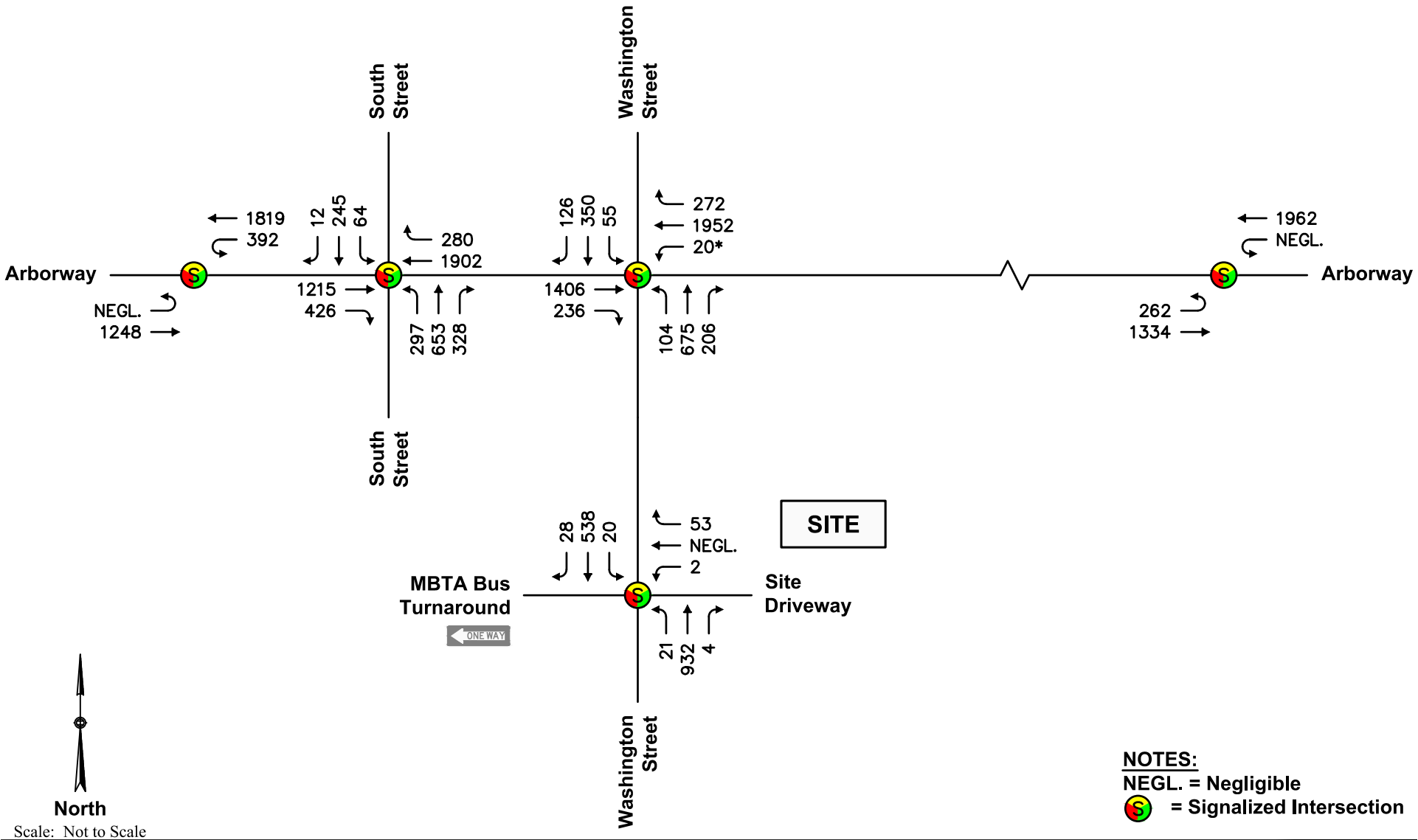


Figure 5-11
2035 Build Condition Weekday Morning Peak Hour
Source: MDM Transportation Associates, Inc., 2016

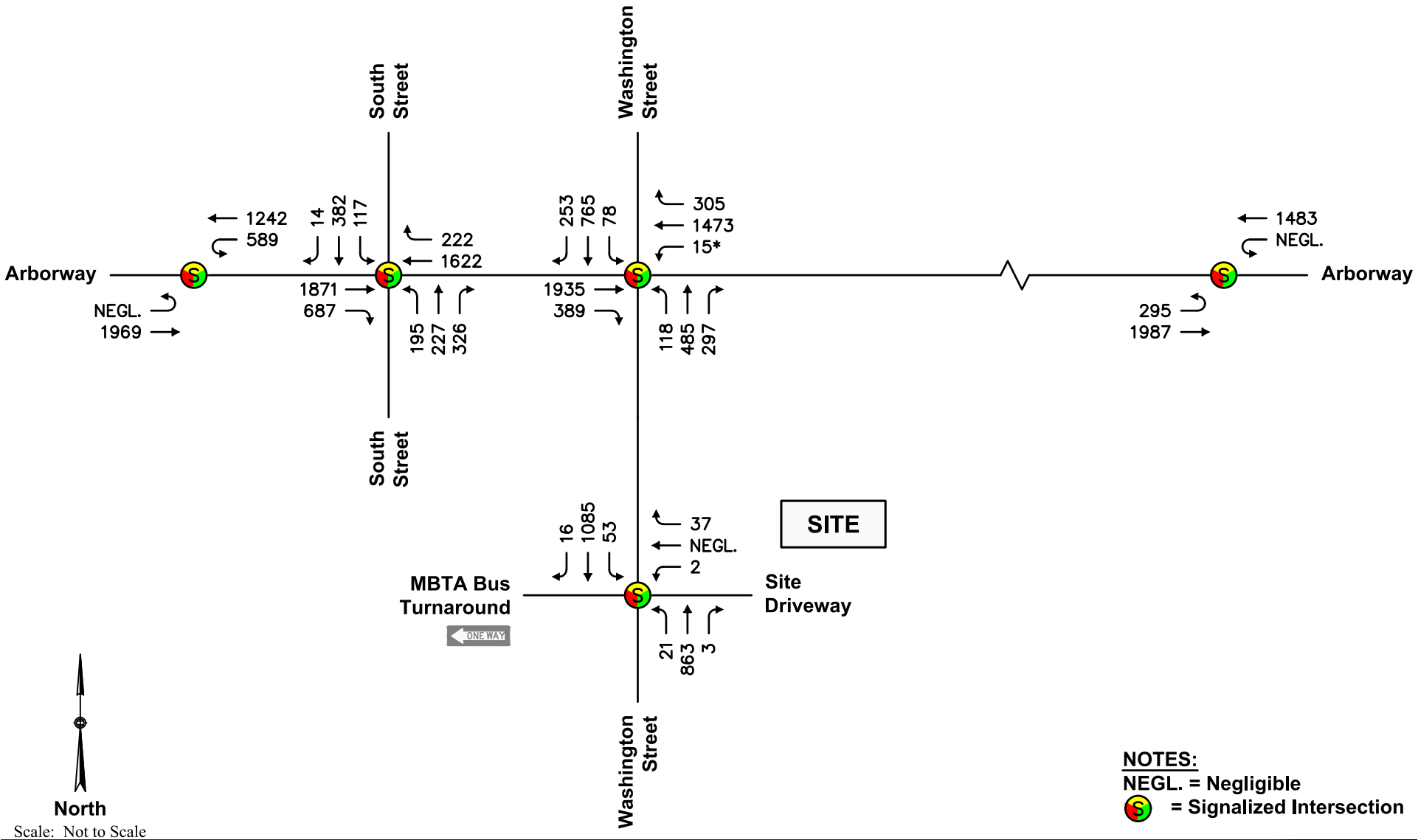


Figure 5-12
2035 Build Condition Weekday Evening Peak Hour
Source: MDM Transportation Associates, Inc., 2016

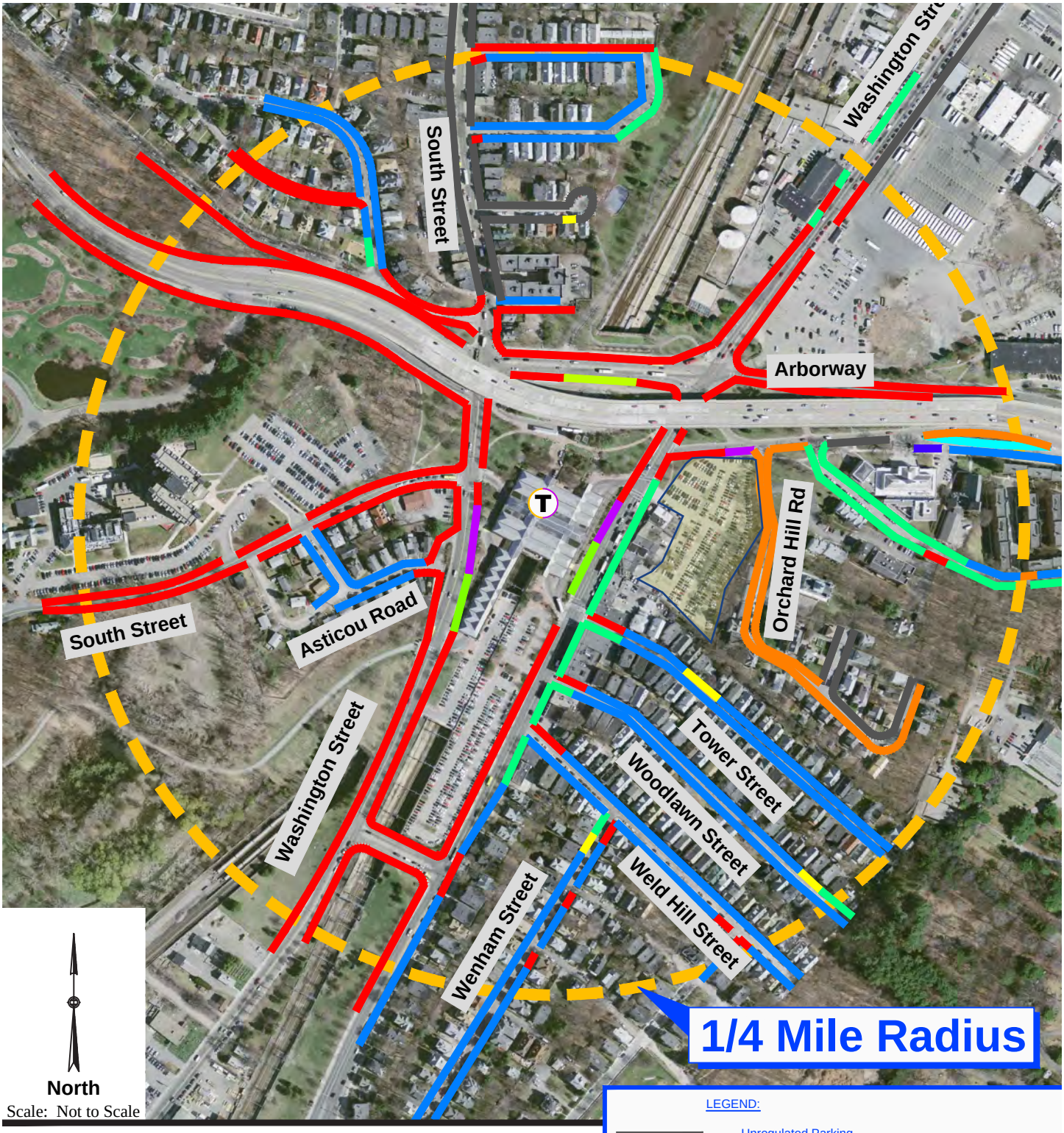


Figure 5-13
Parking Availability
Source: MDM Transportation Associates, Inc., 2016

Chapter 6

ENVIRONMENTAL PROTECTION

CHAPTER 6: ENVIRONMENTAL PROTECTION

6.1 INTRODUCTION

The Project will be built in full compliance with local, state, and federal environmental regulations and will substantially improve the environmental conditions of the Project Site. The Project will not create undue wind, shadow, noise, solar glare, or air quality impacts in the surrounding area.

6.2 WIND

The Project is not expected to have adverse pedestrian-level wind impacts adjacent to, and in the vicinity of, the Project Site due to its modest size and proximity to nearby buildings. Although a wind impact study was not required, it is expected that as a result of the placement of the proposed new building in the existing context, pedestrian level winds along adjacent sidewalks are not anticipated to exceed the BRA guidelines for wind speeds of 31 miles per hour.

6.3 SHADOW

A shadow analysis was conducted for the Project to ensure the proposed buildings would not create adverse shadow impacts to neighboring properties. Table 6-1, Shadow Study Dates and Times, identifies the dates and times for which shadow conditions have been simulated.

Table 6-1, Shadow Study Dates and Times

Date	Time
Vernal Equinox — March 21st	9:00 a.m., 12:00 p.m., 3:00 p.m., 5:00 p.m.
Summer Solstice — June 21st	9:00 a.m., 12:00 p.m., 3:00 p.m., 6:00 p.m.
Autumnal Equinox — September 21st	9:00 a.m., 12:00 p.m., 3:00 p.m., 5:00 p.m.
Winter Solstice — December 21st	9:00 a.m., 12:00 p.m., 3:00 p.m.

The analysis is focused on the impact to the neighboring residential properties, proposed pedestrian areas and sidewalks, and how the three buildings of the Project will affect each other on the Project Site.

Currently, the Project Site consists of a parking lot. The Project will therefore result in net new shadow in excess of the existing conditions. In most cases, the Project's shadow impact to the surrounding residential neighborhood is minimal. The following summary references Figure 6-1 through Figure 6-4, Shadow Study.

Vernal Equinox — March 21

New shadows at the Vernal Equinox are minor and remain on the Project Site with the exception of new shadows falling partially on the eastbound shoulder of the Arborway at 9:00 am and 12:00 pm, and falling on Orchardhill to the east at 3:00 pm and at 6:00 pm.

Summer Solstice — June 21

New shadows at the Summer Solstice are minor and remain on the Project Site with the exception of new shadows at 9:00 a.m. falling across the sidewalk on Washington Street, and falling on Orchardhill to the east at 3:00 pm and at 6:00 pm, though not across the row of single family houses situated on that Street.

Autumnal Equinox — September 21

New shadows during the Autumnal Equinox are minor and remain on the Project Site with the exception of new shadows falling partially on the eastbound shoulder of the Arborway at 9:00 am, 12:00 pm, and 3:00 pm, falling across Washington Street at 9:00 am, and falling on Orchardhill to the east at 3:00 pm and at 6:00 pm.

Winter Solstice — December 21

The Project will create a minor increase in shadow coverage across the Arborway, across Washington Street at 9:00 am, and across Orchardhill at 3:00 pm.

6.4 DAYLIGHT

The Project Site is in a relatively low-density urban setting. The generous width of Washington Street and the green space characterizing the Forest Hills Station entrance will ensure adequate daylight on the west side of the buildings. The generous open space at the core of the Project Site, and the wide landscaped pedestrian passageways between Project's proposed buildings will also increase daylight penetration levels.

6.5 SOLAR GLARE

A solar glare analysis is intended to measure potential reflective glare from the buildings onto streets, public open spaces, and sidewalks in order to determine the likelihood of visual impairment or discomfort due to reflective spot glare. As a result of the design and use of generally non-reflective materials and the distance between the new building and existing buildings, it is not anticipated that the Project will have adverse solar glare impacts or create solar heat buildup in nearby buildings. Trees planted in front of the buildings will further absorb sunlight to minimize its reflection off of the building onto the street and sidewalk.

6.6 AIR QUALITY

This section provides a qualitative review of air quality sources and impacts as a result of the Project from traffic, parking, and heating and mechanical ventilation systems. Impacts from construction and operations are addressed in Section 6.13, Construction Impacts.

6.6.1 TRAFFIC SOURCES

Due to the relatively modest number of net new vehicle trips contributed to the local network by the Project, the impact of project trips on the performance of the transportation study area intersections relative to air quality is minor. The BRA typically requires a future air quality CO analysis for any intersection where the level of service (LOS) is expected to fall to a D or lower and the proposed Project causes a 10% increase in traffic; or where the LOS is E or F and the project contributes to a reduction in LOS.

Transportation Demand Management (TDM) strategies are a significant component of this Project and are anticipated to assist in minimizing traffic impacts and, by extension, air quality impacts. The following measures aim to keep vehicle traffic levels at acceptable volumes, promoting alternative means of transportation that have lesser impacts on overall air quality for the Project:

- Parking management
- Promotion of public transit and dissemination of transit information
- Secure, internal bicycle storage for Project's residents
- Publicly accessible bicycle storage for Project's visitors;
- Zipcar parking

The Project Site is currently covered with a surface parking lot. The Project will enliven the Site with residential apartments, commercial/retail space, and open space and will include 130 covered spaces and 10 surface parking spaces (5 accessible spaces including 1 van accessible space).

In keeping with Boston's Complete Streets Guidelines, a high bicycle to vehicle parking ratio will be used to encourage bicycle use and help reduce parking demand. Combined with the Project's close proximity to transit, these factors will minimize air pollution from parking sources associated with the Project.

6.6.2 BUILDING OPERATION SOURCES

There will be individual heating and cooling units for the residential apartments and a condenser will be located on the roof for the commercial/retail and common areas of the buildings. In combination, these building operation factors are not expected to contribute to significant changes in air quality.

The structured parking will be provided with mechanical ventilation, with intake from garage door openings and louvers, and exhaust via louvers along the back wall.

6.7 NOISE

The Proponent does not anticipate a significant increase in noise impacts associated with the residential or commercial uses at the Site. The Boston Air Pollution Control Commission regulates noise in the City of Boston based on zoning and land use classification. The regulations set fixed noise limits for daytime and nighttime use of equipment serving the building (for residential areas, a maximum level of 60 dBA for daytime use, and 50 dBA for nighttime use is required). These levels are limits for equipment sound assessed at the property lines of the Project. The limits apply to equipment which operates on a significant basis to serve the building, such as air conditioning equipment and fans. In addition to the overall sound level requirements, the regulations list specific octave band frequency limits for daytime and night time periods.

The primary sources of exterior sound for the Project will include individual unit heating and cooling systems, and a rooftop condensing unit serving individual common areas and commercial areas. Based on the general equipment design, the rooftop equipment is residential in scale and is not expected to produce significant sound levels at the building property lines, though noise control measures will be provided if required.

Intermittent increases in noise levels will occur in the short-term during construction. Construction work will comply with the requirements of the City of Boston Noise Ordinance. Noise impacts will be controlled during construction, as appropriate, through the use of mufflers on heavy equipment, construction hour restrictions, and other noise mitigation.

6.8 FLOOD ZONES

In the past decade, climate change adaptation has gained national attention as a critical environmental factor that must be addressed in new development projects. In Boston, sea level rise has become a serious concern as recent weather patterns and future modeling are demonstrating that storms impacting the city are likely to continue to intensify.

As part of its administration of the National Flood Insurance Program (NFIP), the Federal Emergency Management Agency (FEMA) publishes flood hazard maps, called Flood Insurance Rate Maps (FIRM). The purpose of a FIRM is to show the areas in a community that

are subject to flooding and the risk associated with these flood hazards. A new map was published in 2015 that updated the flood zones for this area. According to FEMA, the Project Site is not located in a flood zone.

6.9 WATER QUALITY

During construction, best management practices (BMPs) will be used to limit the transportation of sediment off site. The Contractor will obtain a National Pollution Discharge Elimination System (NPDES) stormwater permit and implement BMPs to minimize pollutant runoff. The Contractor will also use the following water quality related measures:

- Complying with all federal, state, and city codes, ordinances, and regulations governing the on-site discharge of construction dewatering effluent
- Using hay bales and silt fencing to prevent silt or soil from entering existing catch basins
- Using temporary wheel wash areas within the Project Site
- Using temporary gravel entrance berms at the main exits from the Project Site
- Isolating and protecting stockpiled materials
- Monitoring the proper use of tarpaulin covered trucks
- Preventing/controlling truck spillage
- Cleaning the adjacent portions of city streets entering and exiting the Project Site

6.10 GROUNDWATER

The Project includes a partial below-grade level extending 4 to 6 feet below the existing ground surface, which is above the site groundwater level. Further, the Project Site is not located within the Groundwater Conservation Overlay District (GCOD) as established by Article 32 of the City of Boston Zoning Code. Therefore, it is not anticipated that the scope of the proposed construction will impact groundwater levels at the Project Site.

6.11 GEOTECHNICAL

A preliminary subsurface exploration program including ten soil borings and four test pits was performed at the Project Site. The boring locations are evenly spread out across the subject site. The borings were extended through an approximately 4- to 13-foot thick layer of fill and terminated at depths of 15 to 32 feet below the existing ground surface within the natural outwash or glacial till deposit. In addition, groundwater monitoring wells were installed within four of the boreholes to monitor the fluctuation of the groundwater levels over time. The test pits were be performed within the existing slope on the eastern edge of the Project Site and were terminated within the natural outwash deposit at depths between 7.5 and 8 feet below the existing ground surface.

6.11.1 SUBSURFACE SOIL CONDITIONS

The subsurface soil conditions encountered within the borings and test pits generally consisted of a 4- to 13-foot thickness of miscellaneous granular fill. Beneath the granular fill, a natural, inorganic outwash deposit was encountered. The outwash deposit was observed to be 9 to 24 feet thick and generally consisted of compact to dense, brown to gray-brown, sand and silt with some gravel varying to sand and gravel with some silt. The outwash deposit was underlain by a glacial till deposit present at depths ranging from approximately 7 to 25 feet. The glacial till deposit generally consisted of a very dense, light gray to gray-brown, well-graded mixture of silt, sand and gravel with trace clay and occasional cobbles.

6.11.2 GROUNDWATER CONDITIONS

As mentioned previously, four groundwater monitoring wells were installed at the site. During the monitoring period, the groundwater level across the Project Site was typically observed between 12.3 feet and 16.8 feet below ground surface. However, within the monitoring well located near the existing slope on the eastern property line, where the surface of the glacial till deposit is shallower, groundwater appeared to be perched on the surface of the glacial till deposit and was observed at a depth of approximately 6.7 feet below the ground surface. 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, runoff particularly during or following periods of heavy precipitation, and alterations of existing drainage patterns.

6.11.3 PROPOSED CONSTRUCTION

The proposed construction is to include two interconnected 6-story buildings, Buildings A and B, located on the eastern portion of the site and comprised of steel-framed podium garage space overlain by wood-framed residential units. In addition, the proposed building located on the western portion of the Project Site, Building C, is proposed to include one-level of ground floor retail overlain by 5-levels of residential units. The structures are to be separated by the existing BWSC property which is planned to be used as a service road. This area contains the Stony Brook Conduit, which is planned to remain in place as part of the proposed development. The ground floor level parking area is planned to be located 4 to 6 feet below the existing ground surface to help minimize excavation and off-site disposal. Additionally, the buildings on the east side of the service road will be benched into the existing slope along the eastern site property line and a retaining wall will be constructed.

6.11.4 EXCAVATION AND FOUNDATION CONSTRUCTION

Based on the general subsurface soil conditions encountered across the Project Site, the location of the Stony Brook Conduit and subsequent construction requirements, and the proposed construction, the preliminary foundation recommendations include footings with overexcavation of the fill to the surface of the natural soil deposit followed by placement of lean mix concrete to the design bottom of the footing. In addition, isolated areas of the proposed building are recommended to be supported by drilled mini-piles due to the proximity of the Stony Brook Conduit. It is anticipated that conventional slab-on-grade construction will be utilized for the lowest level slabs. Perimeter and underslab drainage are recommended to protect the basement against groundwater intrusion during the possible short-term rises in the groundwater level resulting from events of heavy and/or prolonged precipitation. The foundation drainage system will tie into the existing storm drain system.

A temporary retaining wall is recommended for construction of the portion of the building to be benched into the slope along the eastern property line. The retaining wall is recommended to consist of a cantilevered steel soldier pile and timber lagging system. It is anticipated that conventional driving of the soldier piles will be difficult due to the dense to very dense consistency of the glacial till deposit underlying the site. Therefore, soldier piles are anticipated to be installed within pre-drilled holes and backfilled with lean concrete. An alternative method of temporary excavation support which is considered feasible for the soil conditions is a soil nail wall.

The proposed footing construction and mini-pile installation are not anticipated to generate vibrations that would impact surrounding structures. However, vibrations will be monitored during foundation construction.

6.12 SOLID AND HAZARDOUS WASTE

Environmental due-diligence has been performed as part of the proposed development work relative to applicable standards and regulations.

6.12.1 SITE HISTORY AND COMPLIANCE WITH MA CONTINGENCY PLAN

A Phase I Environmental Site Assessment (ESA) Update report and Phase II ESA performed by others were completed for the subject site on October 28, 2014 and August 25, 2004, respectively. The findings of the site assessment did not indicate the presence of Recognized Environmental Conditions (RECs), as defined in A.S.T.M. E1527-05 on the Project Site. However, the reports identified the historical presence of a former on-site gasoline station and repair shop including six underground storage tanks (USTs) within the northwest portion of the site and a former off-site automotive repair shop located immediately west of the drainage easement and south of the

northwest quadrant of the site. The previous Phase II ESA presented the results of a ground penetrating radar (GPR) survey which did not identify the presence of USTs within the area of the former gasoline station and the results of analytical testing on soil and groundwater samples which did not identify petroleum-related compounded at levels greater than the applicable Massachusetts reportable concentrations. The reports therefore concluded that the historical presence of these former structures were no longer RECs and did not require further investigation.

Based on the proposed scope of construction which is planned to include a partial below-grade parking garage which will be located 4 to 6 feet below the existing ground surface, and the anticipated overexcavation of fill material for footings, it is anticipated that excess excavated soil will be generated and will require off-site disposal.

In anticipation of the generation of excess soils which will require off-site disposal, a preliminary program of chemical testing was performed on samples of the fill and groundwater. The chemical testing included parameters identified in COMM 97-001 (the Landfill Disposal Policy) including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), extractable petroleum hydrocarbons (EPH), volatile petroleum hydrocarbons (VPH), lead, arsenic, total metals, total petroleum hydrocarbons (TPH), T.C.L.P. lead, PCB's, pH, reactivity, and flashpoint.

The results of our preliminary pre-characterization analysis indicated that the fill material will require off-site disposal at facilities including a "less than RCS-1" facility, in-state unlined landfill, in-state lined landfill and an in-state asphalt batch plant. In addition, at two locations the presence of petroleum-related compounds in soil have been encountered in concentrations which exceed the applicable reportable concentrations defined in the Massachusetts Contingency Plan (MCP). One of the detections is located in the middle of the site within the footprint of the proposed eastern building and the other is located in the southwestern portion of the Project Site within the footprint of the proposed western building. No reportable concentrations in groundwater were detected during the investigation.

Further assessment of the two reportable conditions is planned to be performed prior to the start of construction. Response actions including remediation, if required, will be performed in accordance with the MCP and the required closure reports will be prepared. In addition, a final soil pre-characterization program will be conducted at the site. The chemical results will be reported and subsequently, the soil will be properly disposed of off-site.

6.12.2 EXISTING HAZARDOUS BUILDING MATERIALS

The Project Site contains no existing above-grade building structures, therefore demolition and the generation of building materials for disposal will not be required

as part of the proposed construction. In the event that below-grade remains of former buildings are encountered during excavation, they will be managed in accordance with applicable local and state regulations.

6.13 CONSTRUCTION IMPACTS

This section describes the Project impacts during the construction period.

6.13.1 CONSTRUCTION MANAGEMENT PLAN

A Construction Management Plan (CMP), in compliance with the City of Boston's Construction Management Program, will be submitted to the Boston Transportation Department (BTD). This plan will include detailed information about construction activities, specific construction mitigation measures, and construction materials access and staging area plans to minimize impact on the surrounding neighborhood.

Construction methodologies that ensure public safety and protect nearby residents will be employed. Techniques such as barricades, walkways, and signage will be used. Construction management and scheduling will minimize impacts on the surrounding environment and will include plans for construction worker commuting, routing plans for trucking and deliveries, and control of noise and dust. Although the design of the new building is in process, the Proponent has begun to develop a plan for how traffic, parking, and construction staging will be managed during construction.

6.13.2 CONSTRUCTION ACTIVITY SCHEDULE

The construction period for the proposed Project is expected to last approximately 19 months, with the first available residential units open in month 16. The Project will comply with the City of Boston Noise and Work Ordinance. Normal work hours will be from 7:00 AM to 6:00 PM, Monday through Friday, along with any approved exceptions.

6.13.3 CONSTRUCTION TRAFFIC IMPACTS

Designated truck routes will be established to govern where construction trucks access and egress the site. The Proponent will work closely with the BTD in developing a CMP that will include more detail on construction phasing, number of trips, haul routes, and hours of operation.

6.13.4 CONSTRUCTION WORKER PARKING

The number of workers required for the construction of the Project will vary depending upon the stage of construction. Construction workers will typically arrive

and depart prior to peak traffic conditions and the construction trips are not expected to substantially impact traffic conditions.

The general contractor will be responsible for educating all construction workers about public transit options and encouraging the use of High Occupancy Vehicles (HOVs). All construction workers will be encouraged to utilize mass transit and ridesharing options to access the construction site and to minimize vehicle traffic and parking on the local streets. As part of the program to promote public transportation, the following will be implemented:

- Providing on-site secured space for workers' tool storage
- Posting transit schedules and maps at the jobsite
- Distributing informational brochures regarding public transportation
- Notifying all subcontractors and suppliers of the worker access/parking limitations and options

The Proponent will submit a Boston Residents Construction Employment Plan in accordance with the Boston Jobs Policy. The Plan will provide that the Proponent make good faith efforts to employ local tradespeople from the City of Boston. In this effort, the Proponent will meet with local agencies prior to the start of construction to establish a community outreach program.

6.13.5 CONSTRUCTION AIR QUALITY

Short-term air quality impacts from fugitive dust may be expected during the removal of soil materials and during the early phases of the Project Site preparation activities. The construction contract for the Project will require the contractor to reduce potential emissions and minimize air quality impacts. Mitigation measures are expected to include the use of wetting agents where needed on a scheduled basis, covered trucks, minimizing exposed construction debris stored on-site, monitoring construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized, locating aggregate storage piles away from areas having the greatest pedestrian activity when possible, and periodic cleaning of streets and sidewalks to reduce dust accumulations.

6.13.6 CONSTRUCTION NOISE IMPACTS

Intermittent increases in noise levels will occur in the short term during the construction of the new building. Work will comply with the requirements of the City of Boston Noise Ordinance. Efforts will be made to minimize the noise impact of construction activities, including appropriate mufflers on all equipment such as air compressors and welding generators, maintenance of intake and exhaust mufflers, turning off idling equipment, replacing specific operations and techniques with less

noisy ones, and scheduling equipment operations to synchronize the noisiest operations with times of highest ambient noise levels.

6.13.7 SEDIMENT CONTROL MEASURES

During demolition and construction, erosion and sediment control measures will be implemented to minimize the transport of site soils to off-site areas and BWSC storm drain systems. The existing catch basins will be protected with filter fabric or silt sacks to provide for sediment removal from runoff. These controls will be inspected and maintained throughout the construction phase until all areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

Other sediment controls, which will be implemented as needed during construction, will include the following:

- Stacked hay bales and/or silt fence barriers will be installed at the base of stockpiled soils and at erosion-prone areas throughout the construction phase of the Project
- Erosion controls will be maintained and replaced as necessary to ensure their effectiveness
- Where necessary, temporary sedimentation basins will be constructed to prevent the transport of sediment off-site
- Measures to control dust will be implemented during renovations. All debris will be properly contained on the Project Site
- Erosion controls will be maintained and replaced as necessary until the installation of pavement and the establishment of stabilized vegetation at the Project Site

6.13.8 RODENT CONTROL

The contractor will file a rodent extermination certificate with the building permit application to the City. Rodent inspection, monitoring, and treatment will be carried out before, during, and at the completion of all construction work for the Project, in compliance with the City's requirements. Rodent extermination prior to commencing work will treat areas throughout the Project Site, including building interiors. During the construction process, regular service visits will be made to maintain effective rodent control levels.

6.14 WILDLIFE HABITAT

The Project Site is fully developed with urban landscape materials and, as such, the Project will not impact important wildlife habitats. According to the latest Natural Heritage & Endangered Species Program maps, no Priority or Estimated Habitats are located on or near the Project Site.

6.15 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The Project Site does not contain any known structure, site, or building listed or potentially eligible for listing on the National Register of Historic Places or State Register of Historic Places. This site is not within a National Register Historic District or within a historic district that has been identified as potentially eligible for the National Register.

An area of potential effect (APE) of one-quarter mile has been analyzed for the purposes of identifying historic resources in the Project vicinity and assessing potential project-related impacts. A review of the Massachusetts Historical Commission (MHC) Inventory revealed 30 extant inventoried properties (including five structures on the National Register of Historic Places). The APE also overlaps all or part of nine MHC inventoried districts. Among these nine districts are three National Register Districts- Forest Hills Cemetery, Arnold Arboretum, and the Emerald Necklace.

6.15.1 HISTORIC RESOURCES IN THE VICINITY OF THE PROJECT SITE

Historic resources listed on the Massachusetts Inventory of Historic and Archaeological Resources and located in the immediate vicinity of the Project Site, within approximately 0.25 miles, are identified on Figure 6-3, Historic Resources.

The Project Site is separated from the previously identified National Register Districts, Arnold Arboretum, and the individual National Register property within its boundaries by Washington Street and the Forest Hills MBTA station. Similarly, the Project Site is separated from the National Register District, Forest Hills Cemetery, and the four individual National Register properties within its boundaries by a change of grade and a residential neighborhood. Therefore, the Project will have no impact on these historic resources.

The third National Register District within the APE, the Emerald Necklace, directly abuts the Project Site on the northern edge, along the Arborway. This linear park, connects approximately seven miles of Boston green spaces from Franklin Park to downtown. This section of the Emerald Necklace is in a current state of transition due to the recent demolition of the Casey Overpass, which had dominated the Arborway. The Project will enhance this local resource by working with the Department of Conservation and Recreation (DCR) to plan landscape design to enhance and green the edge of the Arborway. See Section 2.2.5 Open Space and Chapter 3, Urban Design.

The six districts that are not included on the National Register are mostly separated from the Project Site by high density single family residential neighborhoods and topographical changes. The two districts that are directly adjacent to the Project Site are Orchard Hill and Tower Street. The Tower Street District is characterized by a multi-family residential neighborhood. The section of this district that abuts the

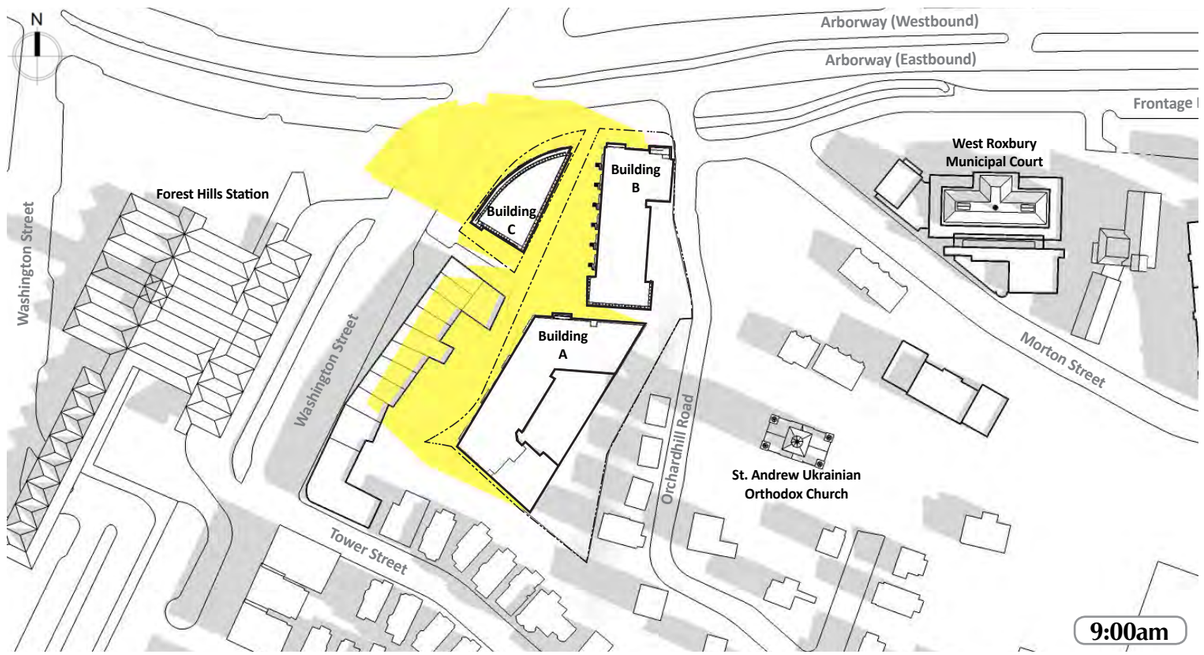
Project Site, approximately five buildings, will have some shadow effects and viewshed alteration. However, the current view from this area is an unappealing vista across a large parking lot, and the visual effect of the Project will be somewhat mitigated by a vegetated area. The Orchard Hill District, characterized largely by single family residences and the Saint Andrew Ukrainian Orthodox Church, abuts the Project Site to the east. There will be little to no impact on this district because it is separated from the Project Site by a vegetated border and a large change in grade.

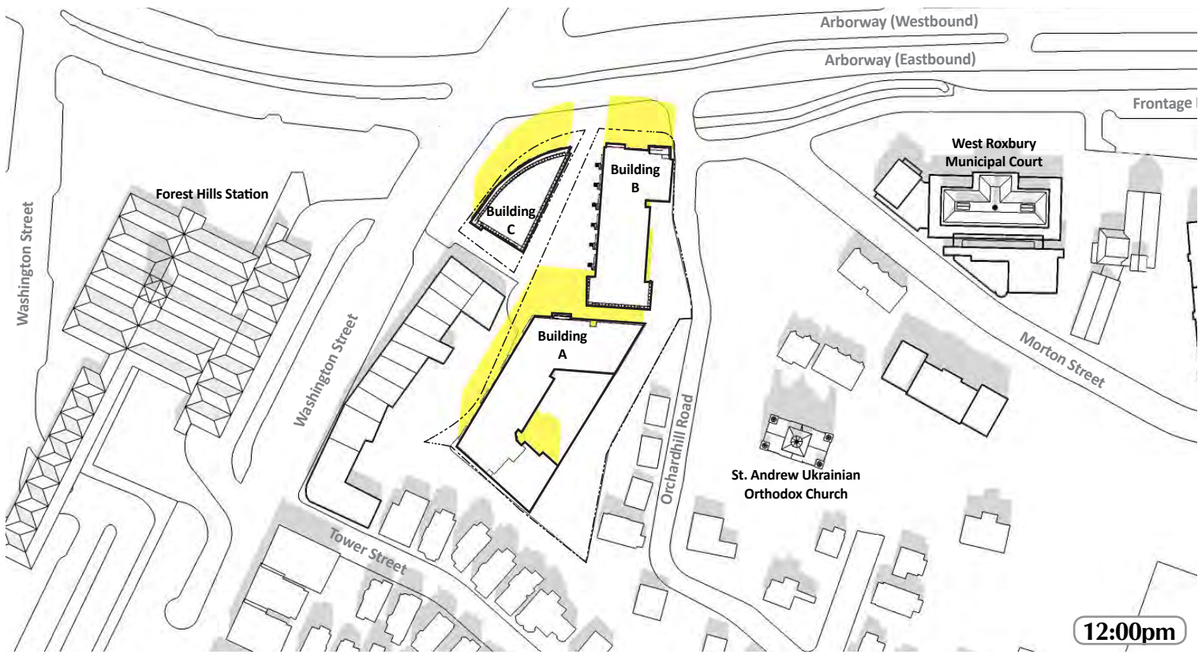
See Table 6-1, for a list of the resources found within the APE.

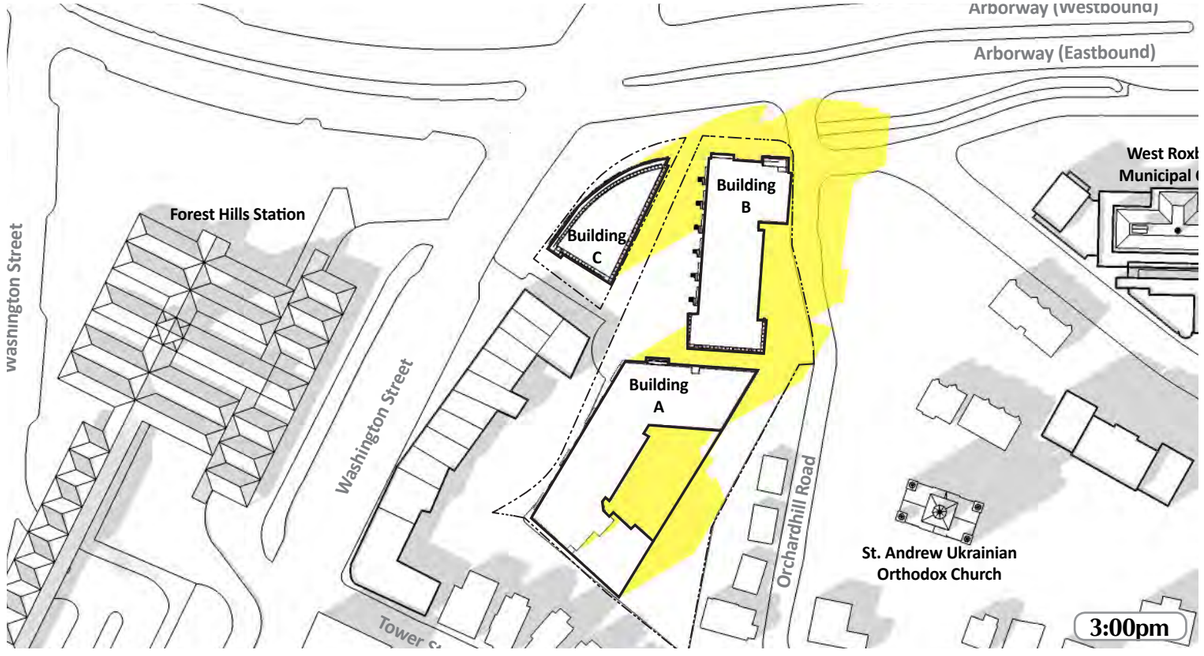
Table 6-2, Historic Resources listed on the Massachusetts Inventory of Historic and Archaeological Resources

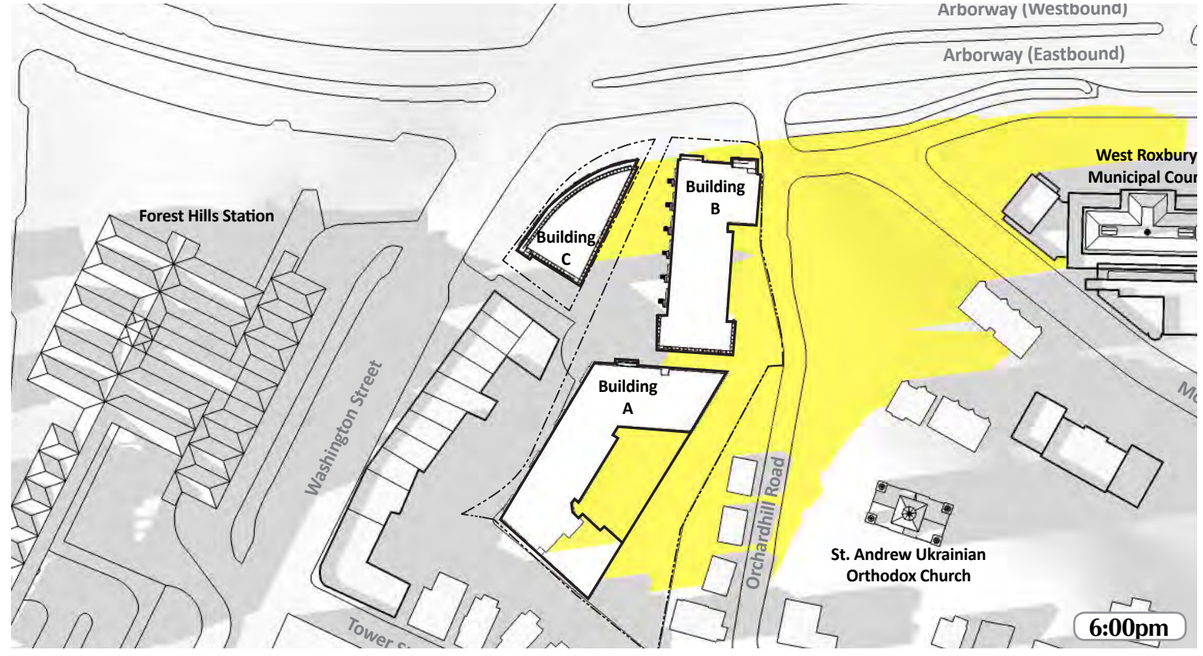
R#	Name	Location	Description of Resource	Impact of Project on Resource
BOS.10201	Arnold Arboretum Worker Housing	South St	Worker housing	No impact
BOS.10411	West Roxbury District Court House	445 Arborway	Classical Revival courthouse constructed in 1922	No impact
BOS.10412	Swedish Congregational Church	455 Arborway	A pre-war church, also known as Covenant Congregational Church constructed in 1935	No impact
BOS.10583	Thomas F. Minton Building	2-16 Hyde Park Ave	Historic, Classical Revival apartment house	No impact
BOS.10634	Jacob W. Seaver House	40 Orchardhill Rd	Greek Revival	No impact
BOS.10635	Saint Andrew Ukranian Orthodox Church	24 Orchardhill Rd	Not researched	No impact
BOS.10636	Elizabeth Minton House	41 Orchardhill Rd	Queen Anne	No impact
BOS.10637	John Minton House	45 Orchardhill Rd	Colonial Revival	No impact
BOS.10638		59 Orchardhill Rd	Colonial Revival	No impact
BOS.10639		67 Orchardhill Rd	Colonial Revival	No impact
BOS.10640		72 Orchardhill Rd	Colonial Revival	No impact
BOS.10742	Thomas Minton Two-Family House	33 Tower St	Colonial Revival	No impact
BOS.10743	Thomas F. Minton Three Decker	16 Tower St	Colonial Revival Triple-decker	No impact
BOS.10787	Weld and Browne Two-Family House	57 Weld Hill St	Colonial Revival	No impact
BOS.10788	Weld and Browne Two-Family House	37 Weld Hill St	Queen Anne	No impact
BOS.10789	Weld and Browne Two-Family House	31 Weld Hill St	Queen Anne	No impact

R#	Name	Location	Description of Resource	Impact of Project on Resource
BOS.10790	Weld and Browne Two-Family House	16 Weld Hill St	Not researched	No impact
BOS.10791	Weld and Browne Two-Family House	24 Weld Hill St	Not researched	No impact
BOS.10803	Lanin Realty Company Three Decker	47 Woodlawn St	Colonial Revival Triple-decker	No impact
BOS.10804	Lanin Realty Company Three Decker	49 Woodlawn St	Colonial Revival Triple-decker	No impact
BOS.10805	Lanin Realty Company Three Decker	32 Woodlawn St	Colonial Revival Triple-decker	No impact
BOS.10806		15-17 Woodlawn St	Colonial Revival	No impact
BOS.10807		80 Woodlawn St	Second Empire	No impact
BOS.10810		39 Yale Terr	Second Empire	No impact
BOS.10811		45 Yale Terr	Second Empire	No impact
BOS.15369	Forest Hills Cemetery Staff Residence	95 Forest Hills Ave	Second Empire	No impact
BOS.15370	Forest Hills Cemetery Greenhouse	95 Forest Hills Ave	Not researched	No impact
BOS.15371	Forest Hills Cemetery Service Buildings	95 Forest Hills Ave	Not researched	No impact
BOS. 9347	Arnold Arboretum	Arborway	Oldest public arboretum in the country, established in 1872	No impact



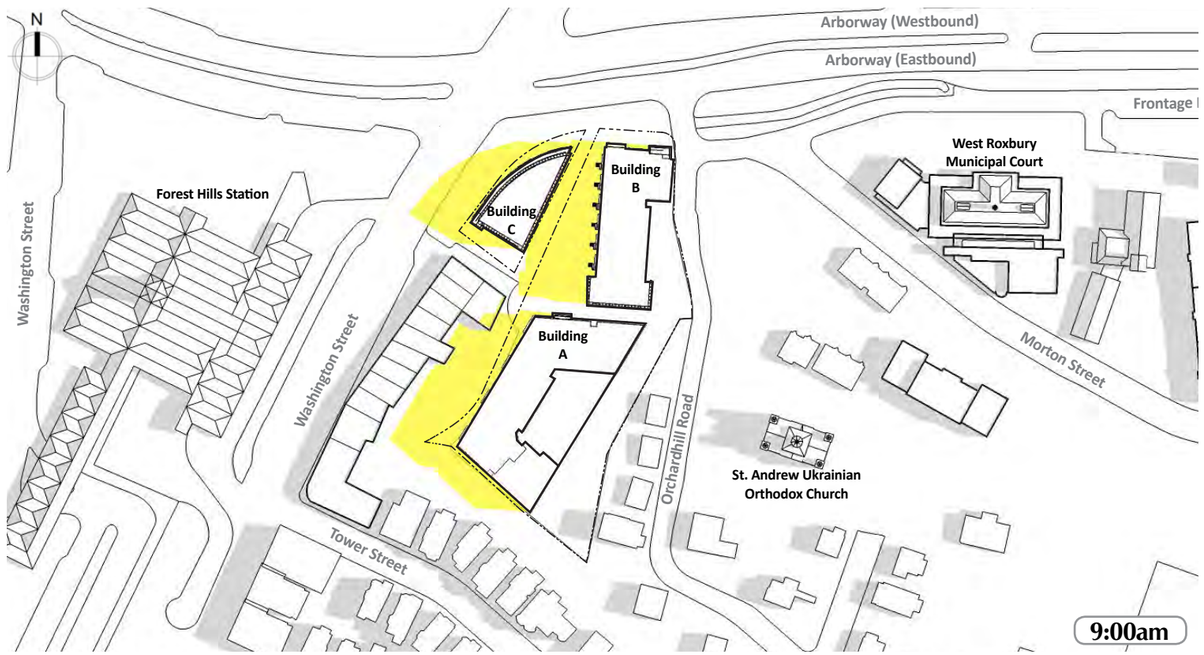


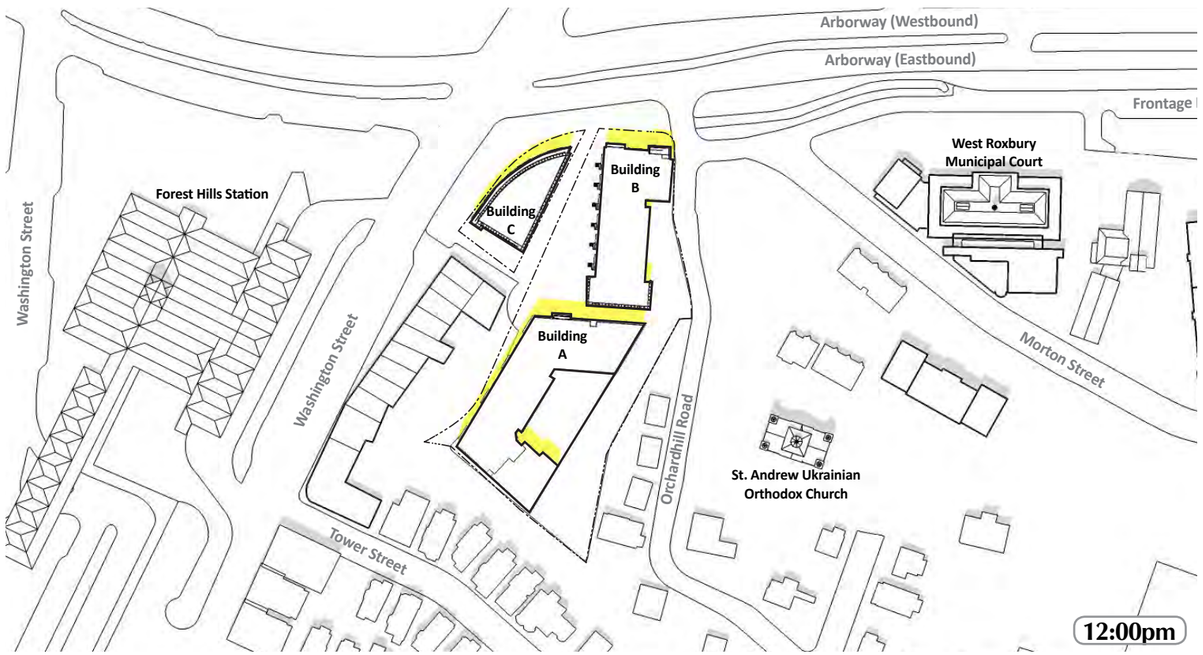


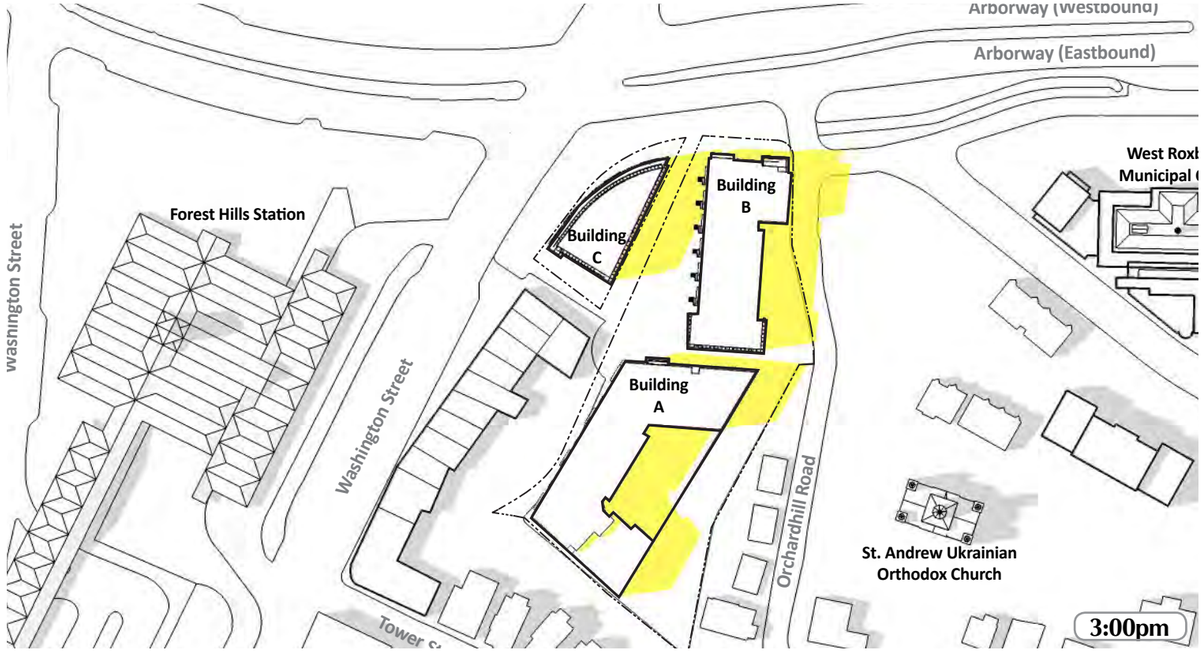


New Net Shadow Existing Shadow

Figure 6-1
Shadow Study- Spring Equinox, March 21
Source: ICON Architecture, 2016







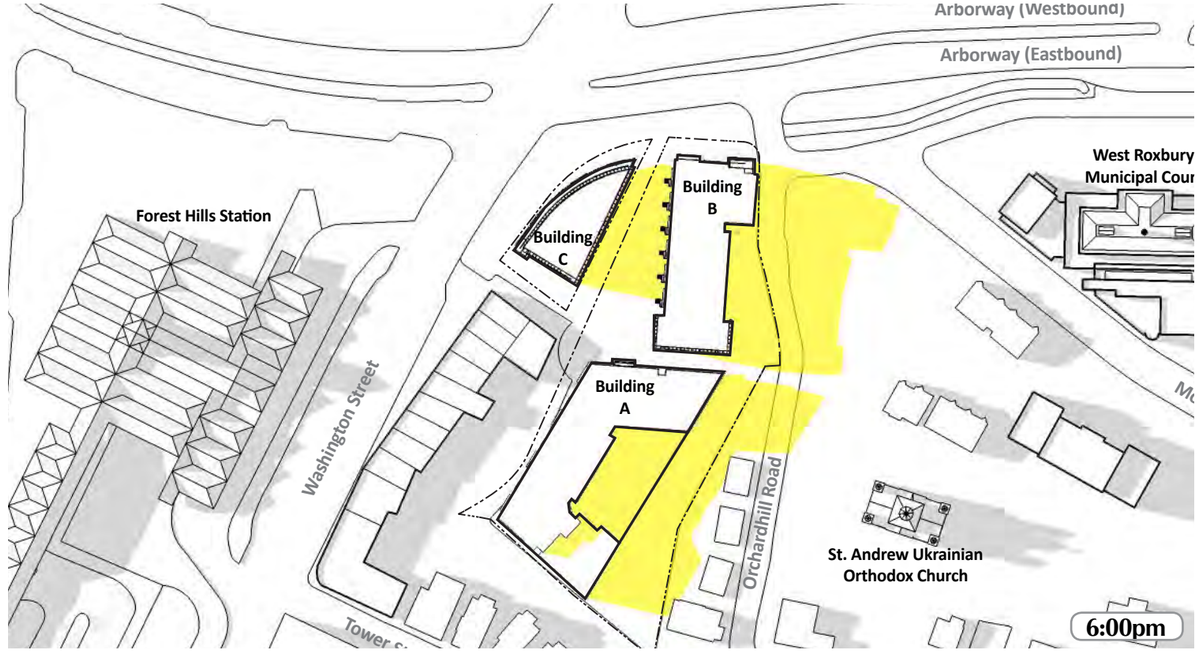


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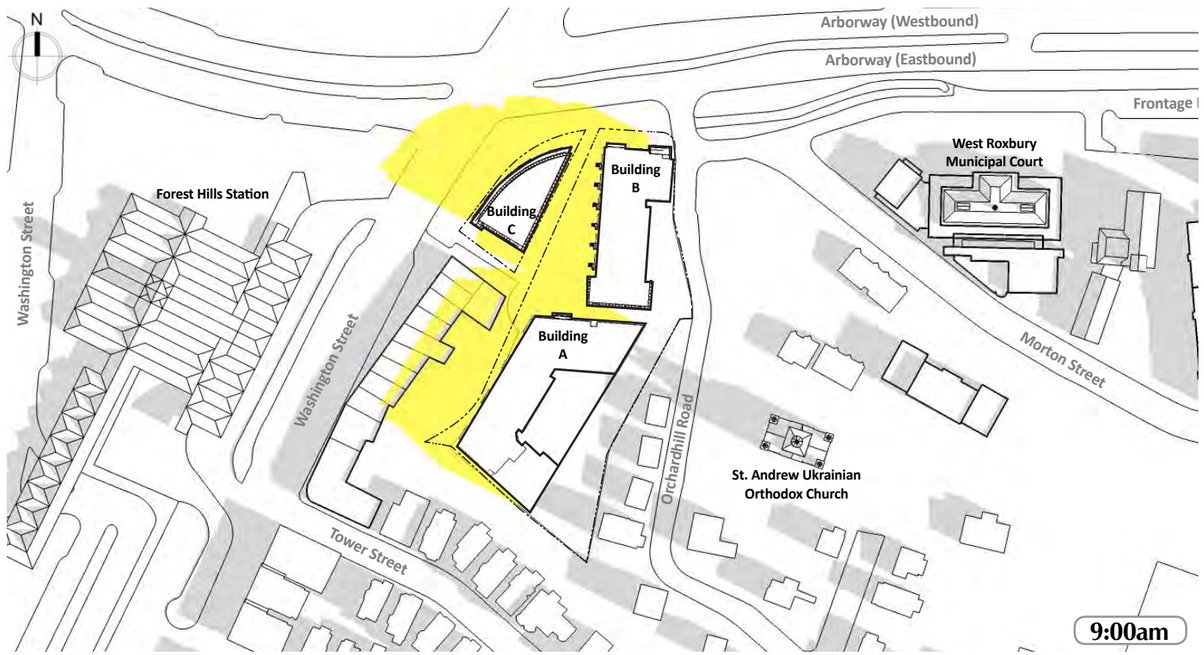
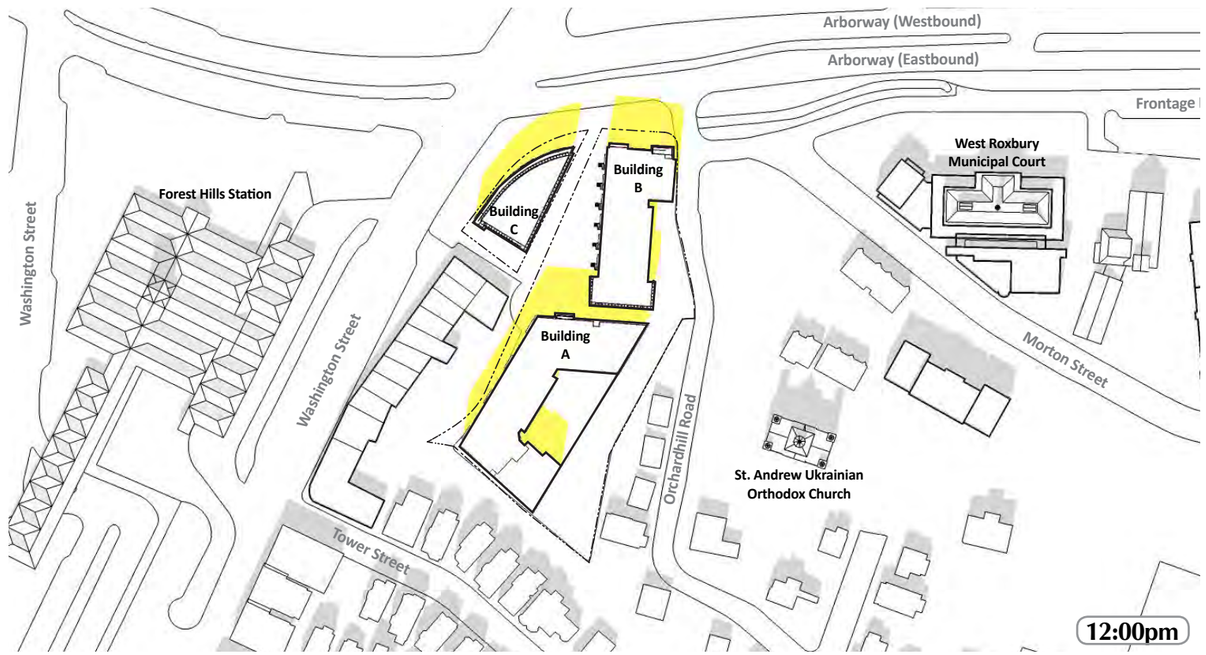
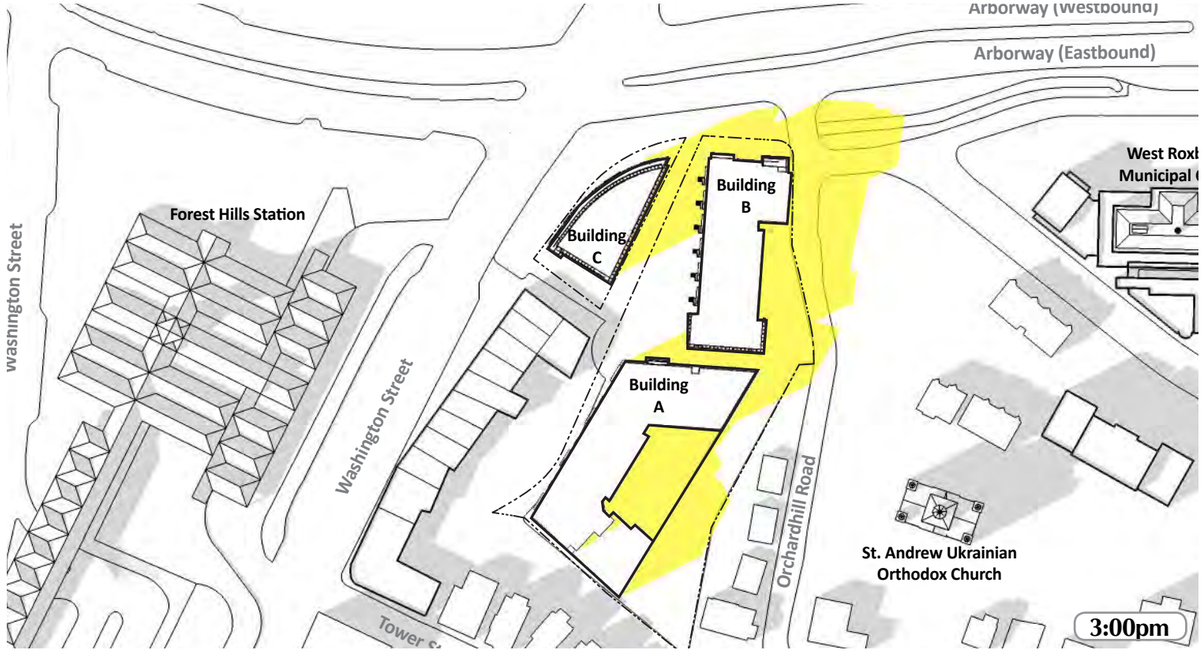
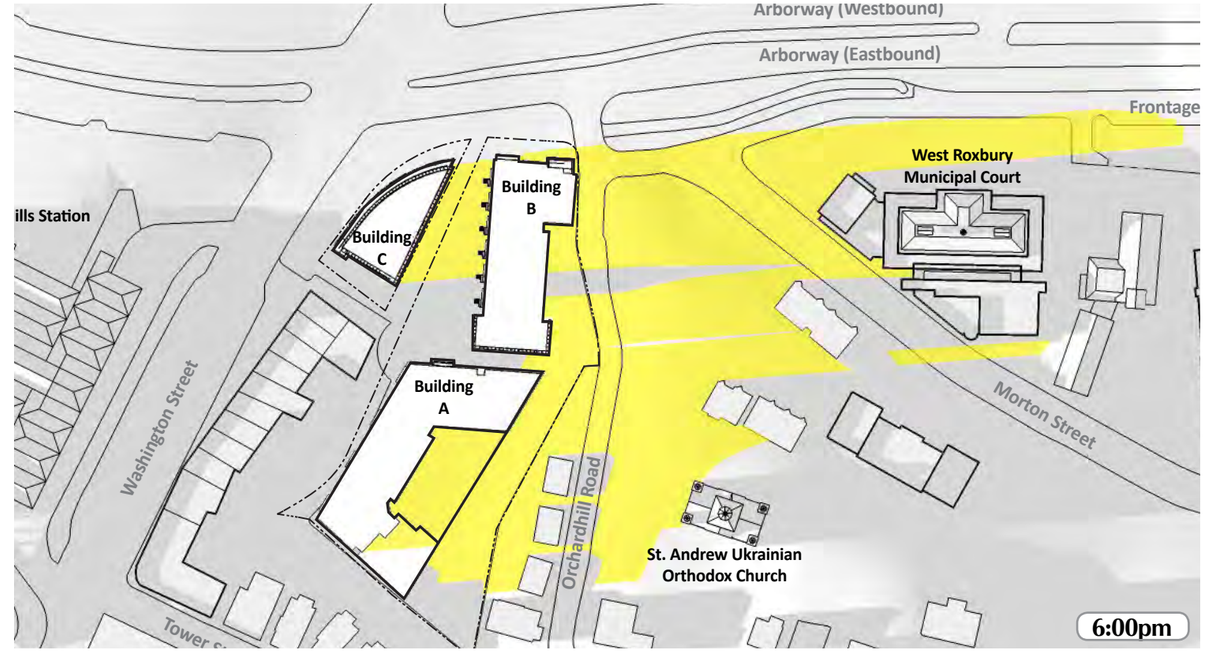
Figure 6-2
Shadow Study- Summer Solstice, June 21
Source: ICON Architecture, 2016



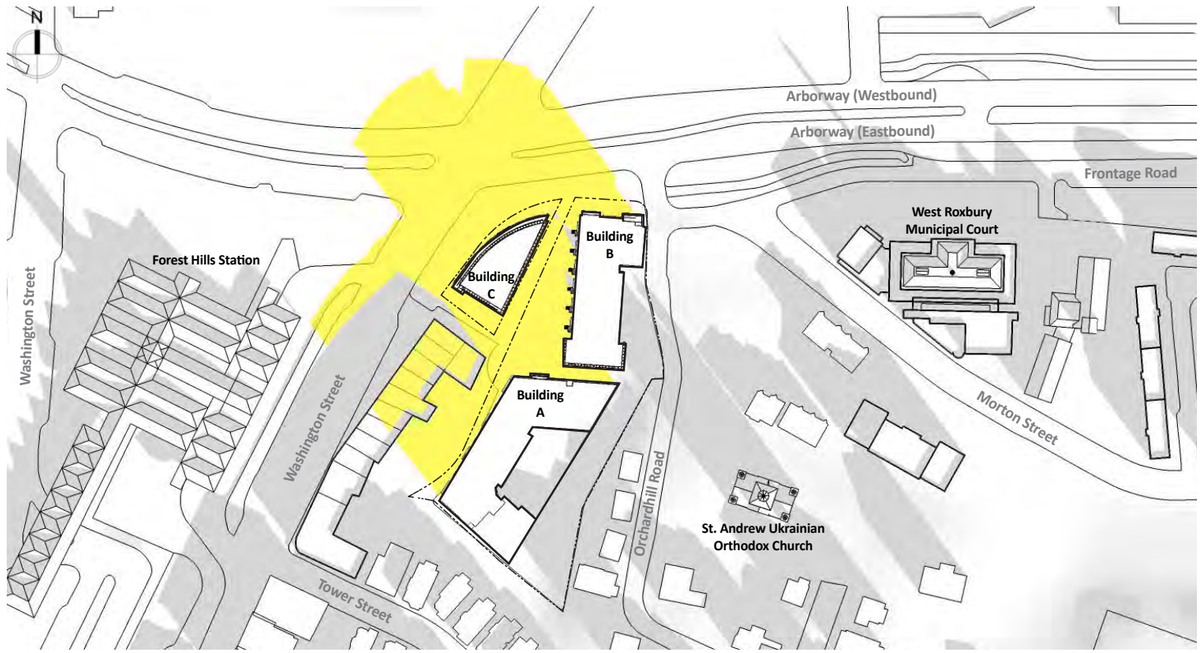






New Net Shadow Existing Shadow

Figure 6-3
Shadow Study- Autumnal Equinox, September 21
Source: ICON Architecture, 2016



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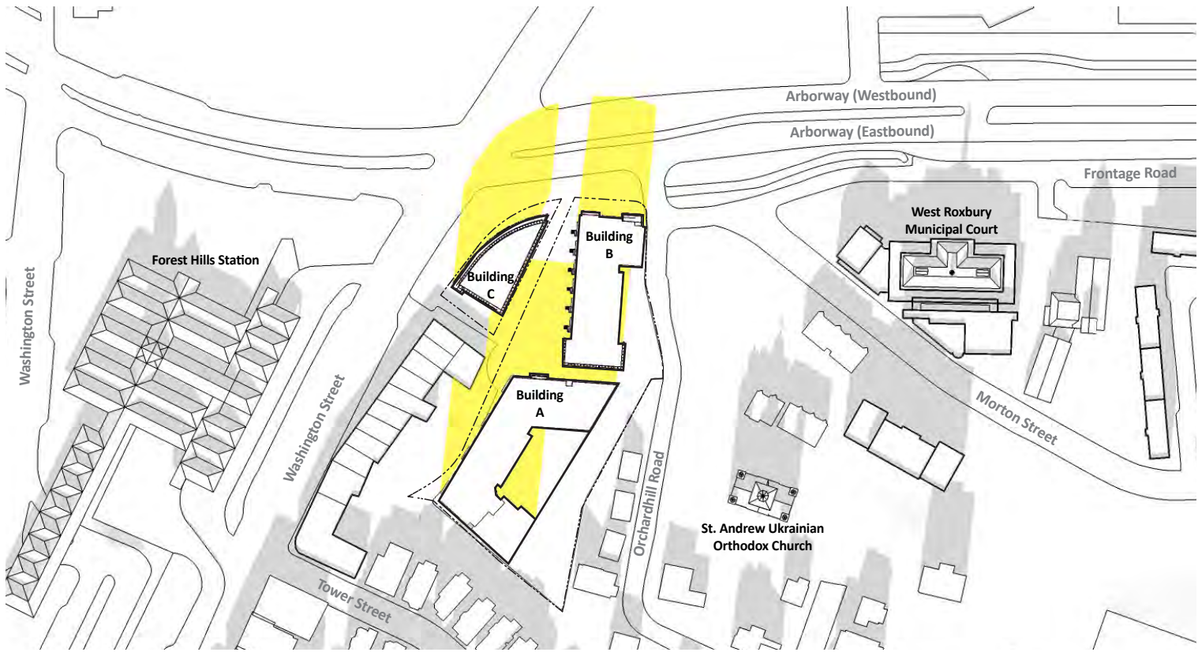

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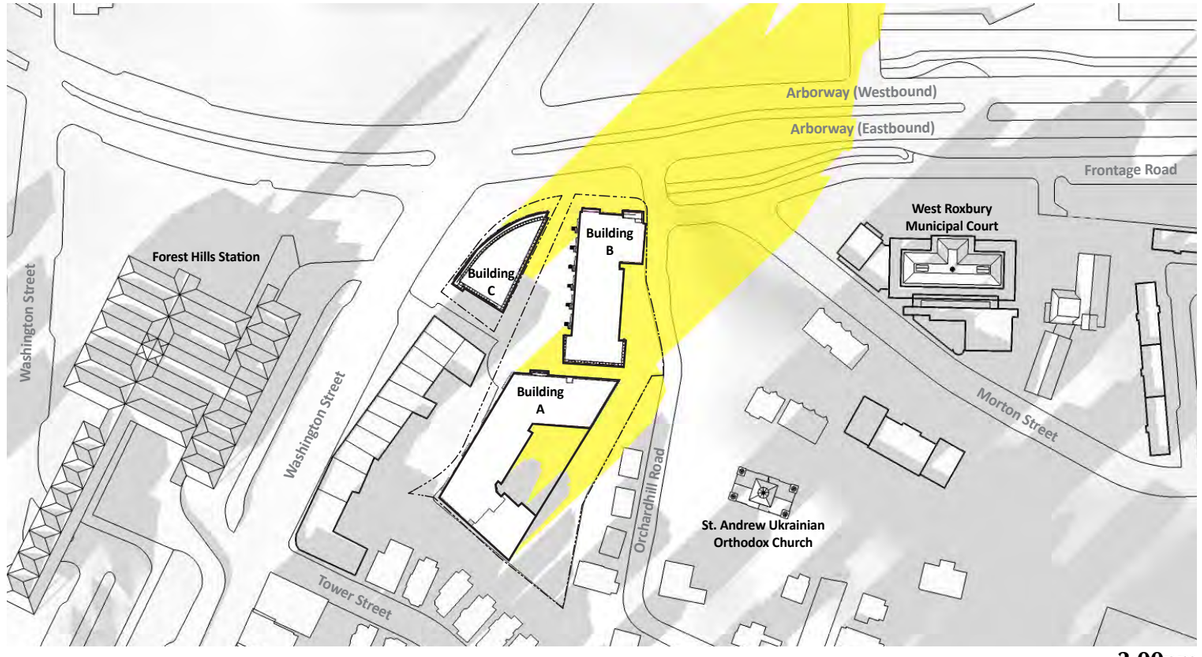


3:00pm

New Net Shadow **Existing Shadow**

Figure 6-4
Shadow Study- Winter Solstice, December 21
Source: ICON Architecture, 2016

Properties Listed on the National Register of Historic Places

1 Forest Hills Cemetery Service Building
2 Forest Hills Cemetery Greenhouse
3 Forest Hills Cemetery Staff Residence
4 Forest Hills Chapel and Admin. Building
5 Arnold Arboretum Worker Housing
Arnold Arboretum District
Forest Hills Cemetery
Emerald Necklace

Properties Inventoried in MA Cultural Resources Information System

6 West Roxbury District Court House
7 Swedish Congregational Church
8 Saint Andrew Ukrainian Orthodox Church
9 39 Yale Terrace
10 45 Yale Terrace
11 72 Orchardhill Road
12 67 Orchardhill Road
13 59 Orchardhill Road
14 Thomas F. Minton House
15 John Minton House
16 Elizabeth Minton House
17 Thomas F. Minton Three-Decker
18 Thomas Minton Two-Family House
19 Lanin Realty Company Three-Decker
20 Lanin Realty Company Three-Decker
21 Lanin Realty Company Three-Decker
22 80 Woodlawn Street
23 Weld and Browne Two-Family House
24 Weld and Browne Two-Family House
25 Weld and Browne Two-Family House
26 Weld and Browne Two-Family House
27 Weld and Browne Two-Family House
28 15-17 Woodlawn Street
29 Thomas F. Minton Building
30 Benjamin French Double House
Orchard Hill
Tower Street
Woodlawn
Weld Hill
Yale Terrace
Bussey Institute

Figure 6-5
Historic Resources
Source: Fort Point Associates, Inc., 2016

Chapter 7

INFRASTRUCTURE

CHAPTER 7: INFRASTRUCTURE

7.1 INTRODUCTION

This chapter describes the existing utility systems servicing the Project Site and surrounding area, discusses the Project's potential impacts on these utilities, and identifies mitigation measures to address potential impacts.

To ensure the Project can be adequately serviced by existing and/or proposed new infrastructure, final engineering and design will be determined once the Project has received necessary approvals. During the design and construction of the Project the engineer and architect will coordinate with the appropriate agencies and utility owners.

The Project includes the construction of a 252-unit residential development on an approximately 2.3 acre site consisting of two 6-story multi residential buildings connected by a one level below grade garage, and one 6-story residential building with ground level commercial space. The Project site is located in the Jamaica Plain neighborhood of Boston and is bounded by the Arborway to the north, Orchardhill Road to the east, residential homes (on Tower Street) to the south, and commercial buildings and Washington Street to the west. The Project Site is divided into two parcels by a BWSC parcel that was established above the existing storm drain and sanitary sewer infrastructure running through the Project Site described below.

7.2 WASTEWATER

7.2.1 EXISTING SEWER SYSTEM

There are existing Boston Water and Sewer Commission (BWSC) sanitary sewer mains located in the Arborway, Orchardhill Road, and Washington Street, an existing combined sewer main in Washington Street, as well as the West Roxbury Lower Level Sewer connected to the BWSC Stony Brook Conduit running through the Project site. The existing BWSC sewer system is shown in Figure 7-1.

The Arborway

There is a 10-inch BWSC sanitary sewer main in the northern side of the Arborway which flows westerly, a 10-inch BWSC sanitary sewer main in the southern side of the Arborway which flows easterly, and a 12-inch BWSC sanitary sewer main in the southern side of the Arborway which flows westerly. These sanitary sewers connect to the West Roxbury Lower Level Sewer flowing northerly.

Orchardhill Road

There is a 10-inch BWSC sanitary sewer main in Orchardhill Road which flows northerly to connect to the 12-inch sanitary sewer main in the Arborway.

Washington Street

There is a 10-inch BWSC sanitary sewer main in Washington Street which flows northerly to connect to the 10-inch sanitary sewer main in the Arborway. Additionally, there is a 36-inch x 48-inch combined sewer main, known as the Stony Brook Valley Sewer, which flows northerly and connects to the West Roxbury Lower Level Sewer at Rossmore Road.

Project Site

The 32-inch x 48-inch BWSC sanitary sewer main, known as the West Roxbury Lower Level Sewer is attached to the 240-inch x 192-inch storm drain main, known as the Stony Brook Conduit and flows northerly through the Project Site. The West Roxbury Lower Level Sewer enters the Project Site from the corner of Washington Street and Tower Street and exits the site at the Arborway, running mostly parallel to Washington Street adjacent to the Project Site.

The sanitary sewer mains in the vicinity of the Project are collected by the West Roxbury Lower Level Sewer which flows northerly and ultimately discharges to the Massachusetts Water Resource Authority (MWRA) Deer Island Wastewater Treatment Plant for treatment and disposal.

7.2.2 PROJECTED SANITARY FLOW

The Project's projected sanitary flows were estimated using 310 CMR 15.203, the Massachusetts Department of Environmental Protection (DEP) "The State Environmental Code, Title 5" design criteria for uses consistent with the current proposed building programs. 310 CMR 15.203 lists typical sewage generation values by the proposed building use and are conservative values for estimating the sewage flows from buildings. The 310 CMR 15.203 values are used to evaluate new sewage flows due to a proposed Project.

Table 7-1: Sanitary Flows

Proposed Use	Units/Size	Design Flow Rate (GPD/unit)	Proposed Sanitary Flows (GPD)
Building A			
Residential	169 bedrooms	110/bedroom	18,590
Building B			
Residential	113 bedrooms	110/bedroom	12,430
Building C			
Residential	50 bedrooms	110/bedroom	5,500
Retail	6,686 sf	50/1,000 sf	204
Total Proposed Sanitary Flow			36,724
Total Existing Sanitary Flow			0
Total Complete Project Increase in Sewer Flows			36,724

7.2.3 PROPOSED CONDITIONS

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the BWSC sewer system. The Project sewer generation is expected to be approximately 36,724 gallons per day (gpd). The existing site use is a parking lot and does not generate sewer flows. Approval for the new sanitary flow from the Project Site will come from BWSC.

The sewer services for the proposed buildings will connect to the existing BWSC sanitary sewer mains located in the Arborway, Washington Street, and/or the West Roxbury Lower Level Sewer within the Project Site.

Improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's Site Plan Review process for the Project. This process will include a comprehensive design review of the proposed service connections, an assessment of Project demands and system capacity, and the establishment of service accounts.

7.2.4 IMPACT ON EXISTING SEWER SYSTEM

The Project's impact on the existing BWSC sanitary sewer systems in the southern side of the Arborway, Washington Street, and the West Roxbury Lower Level Sewer were analyzed. Orchardhill Road is at an elevation higher than the majority of the Project Site, so sewer connections to the main are not anticipated. The existing sewer system capacity calculations are presented in Table 7-2.

Table 7-2: Sewer Hydraulic Capacity Analysis

Sewer Main	Slope (%)	Diameter (inches)	Manning's Number	Flow Capacity (cfs)	Flow Capacity (MGD)
Arborway (flowing east to the West Roxbury Lower Level Sewer)					
10 to 29	0.3%	10	0.013	1.15	0.75
			Minimum Flow Analyzed:	1.15	0.75
Arborway (flowing west to the West Roxbury Lower Level Sewer)					
7 to 29	0.8%	12	0.013	3.18	2.05
			Minimum Flow Analyzed:	3.18	2.05
Washington Street					
12 to 11	0.4%	10	0.013	1.40	0.91
11 to 10	0.4%	10	0.013	1.40	0.91
			Minimum Flow Analyzed:	1.40	0.91
West Roxbury Lower Level Sewer (Running Through Project Site)					
71 to 28	0.04%	32 x 48	0.013	3.50	2.26
28 to 29	0.04%	32 x 48	0.013	4.31	2.78
			Minimum Flow Analyzed:	3.50	2.26

Table 7-2 indicates the hydraulic capacity of the 10-inch sanitary sewer main in the Arborway (flowing east to the West Roxbury Lower Level Sewer), the 12-inch sanitary sewer main in the Arborway (flowing west to the West Roxbury Lower Level Sewer), the 10-inch sanitary sewer main in Washington Street, and the West Roxbury Lower Level Sewer running through the Project Site. The minimum hydraulic capacity is 0.75 million gallons per day (MGD) or 1.15 cubic feet per second (cfs) for the 10-inch system in the Arborway flowing east; 3.18 MGD or 2.05 cfs for the 12-inch system in the Arborway flowing west; 0.91 MGD or 1.40 cfs for the 10-inch system in Washington Street; and 2.26 MGD or 3.50 cfs for the West Roxbury Lower Level Sewer. Based on an increase in average daily flow of 36,724 GPD or 0.037 MGD; and with a factor of safety of 10 (total estimate = 0.37 MGD x 10 = 0.37 MGD), no capacity problems are expected for the sanitary sewer mains in the Arborway, Washington Street, and/or the West Roxbury Lower Level Sewer due to the Project.

The proposed buildings will require sanitary sewer connections to the BWSC sewage system. Approval from the BWSC will be obtained through their Site Plan Review Process. Coordination with BWSC will include review and approval of the design, capacity, connections, and flow increase resulting from the proposed discharges to the sanitary sewer system.

7.3 WATER SYSTEM

7.3.1 EXISTING WATER SYSTEM

Water for the Project Site will be provided by the BWSC. There are five water systems within the City, and these provide service to portions of the City based on ground surface elevation. The five systems are southern low (commonly known as low service), southern high (commonly known as high service), southern extra high, northern low, and northern high. There are existing BWSC and MWRA water mains in the Arborway, Orchardhill Road, and Washington Street. The existing BWSC and MWRA water systems are illustrated in Figure 7-2.

There is a 12-inch BWSC Southern High Main and a 36-inch MWRA Southern High Main in the Arborway. There is an 8-inch Southern High Main in Orchardhill Road. There is a 16-inch BWSC Southern High Main and a 24-inch MWRA Southern High Main in Washington Street.

BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the Project Site was requested by the Proponent. Hydrant flow data was not available for hydrants near the Project Site at the time of this report. As the design progress, the Proponent will request hydrant flows be conducted by BWSC adjacent to the Project Site.

7.3.2 ANTICIPATED WATER CONSUMPTION

The Project's water demand estimate for domestic services is based on the Project's estimated sewage generation, described in the previous section. A conservative factor of 1.1 (10%) is applied to the estimated average daily wastewater flows calculated in Table 7-1 to account for consumption, system losses and other usages to estimate an average daily water demand. The total estimated domestic water demand is approximately 40,396 gpd.

7.3.3 PROPOSED WATER SERVICES

The domestic and fire protection water services for the Project will connect to the existing BWSC water mains in Morton Street, Orchardhill Road, and/or Washington Street. The proposed Project's impacts to the existing water system will be reviewed as part of the BWSC's Site Plan Review process.

New domestic and fire protection water service connections required for the Project will meet the applicable BWSC, City, and State codes and standards, including cross-connection backflow prevention. Compliance with the standards for the domestic water system service connections will be reviewed as part of BWSC's Site Plan Review Process. This review will include sizing of domestic water and fire

protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and siamese connections that conform to BWSC and Boston Fire Department requirements.

7.3.4 WATER SUPPLY CONSERVATION AND MITIGATION MEASURES

Measures to reduce water consumption will be incorporated into the Project design. The State Building Code requires the use of water-conserving fixtures. Water conservation measures such as low-flow toilets and restricted flow faucets will help reduce the domestic water demand on the existing distribution system. The installation of sensor-operated sinks with water conserving aerators and sensor-operated toilets in restrooms will be incorporated into the design plans for the Project as applicable.

New water services will be installed in accordance with the latest local, state, and federal codes and standards. Backflow preventers will be installed at both domestic and fire protection service connections. New meters will be installed with Meter Transmitter Units (MTUs) as part of the BWSC's Automatic Meter Reading (AMR) system. If individual occupants of a unit intend to perform operations that will require significantly more water consumption than the average values assumed for the design, they will be required to provide information on their process and associated water conservation measures.

7.4 STORM DRAINAGE

7.4.1 EXISTING STORM DRAINAGE SYSTEM

The existing Project Site is approximately 85 percent impervious and is mainly comprised of paved parking lot with a strip of trees and grass on the southern side of the site. There do not appear to be existing closed drainage systems on the Project Site, however, there are two catch basins located above the Stony Brook Conduit within the BWSC parcel that collect stormwater. Stormwater from the parking lot currently sheet flows off-site to catch basins in the adjacent roadways. There are existing BWSC storm drain mains in the Arborway, Orchardhill Road, and Washington Street and the Project Site in the City of Boston parcel. See Figure 7-3, BWSC Drain System Map.

<u>The Arborway</u>

There is a 15-inch BWSC storm drain main with catch basins in the southern side of the Arborway and at the corner of Washington Street and the Arborway, which flows easterly to the Stony Brook Conduit. There is a 12-inch BWSC storm drain main in the southern side of the Arborway which flows westerly and connects to the

Stony Brook Conduit. There is also an 18-inch storm drain main in the northern side of the Arborway which flows westerly to the Stony Brook Conduit.

Orchardhill Road

There is a 12-inch BWSC storm drain main with catch basins to collect stormwater in Orchardhill Road. The 12-inch BWSC storm drain flows northerly and connects to the 12-inch storm drain in the Arborway which flows westerly and connects to the Stony Brook Conduit.

Washington Street

There is a 12-inch BWSC storm drain main with catch basins in Washington Street which flows southerly, increases to an 18-inch storm drain main and connects to the Stony Brook Conduit at the corner of Washington Street and Tower Street prior to the Stony Brook Conduit running through the Project Site.

Project Site

There is a 240-inch x 192-inch BWSC storm drain, known as the Stony Brook Conduit, which flows northerly through the Project Site. The Stony Brook Conduit ultimately discharges to the Charles River.

7.4.2 PROPOSED STORM DRAINAGE SYSTEM

The Project will maintain or decrease the amount of impervious area on the Project Site. The proposed impervious area will comprise approximately 71 percent of the Project Site, and will consist mainly of building roofs, paved parking, and pedestrian walkways. The remaining Project Site area will be grass and landscaped areas. The Project will promote a reduction of stormwater runoff peak rates and volumes, and minimize the loss of annual stormwater recharge to groundwater through the use of on-site infiltration measures to the greatest extent practicable.

The Project design will include a closed drainage system that will be adequately sized for the Site's expected stormwater flows, and will direct stormwater to on-site infiltration systems for groundwater recharge prior to overflow to the BWSC storm drain systems to the maximum extent practicable. The on-site infiltration system will strive to infiltrate one-inch (1″) of stormwater runoff from impervious areas of the site to the greatest extent practicable, in order to meet BWSC requirements. The Project is not located within the Groundwater Conservation Overlay District.

Improvements to the BWSC infrastructure will be evaluated as part of the BWSC Site Plan Review Process.

7.4.3 WATER QUALITY IMPACT

The Project will not affect the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the transport of site soils to off-site areas and BWSC storm drain systems. During construction, existing catch basins will be protected with filter fabric, straw bales, and/or crushed stone, to provide for sediment removal from runoff. These controls will be inspected and maintained throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

Necessary dewatering will be conducted in accordance with applicable MWRA and BWSC discharge permits. Once construction is complete, the Project will be in compliance with City and state stormwater management policies, as described below.

7.4.4 MITIGATION MEASURES

In March 1997, MassDEP adopted a new Stormwater Management Policy to address non-point source pollution. In 1997, DEP published the Massachusetts Stormwater Handbook as guidance on the Stormwater Policy, which was revised in February 2008. The Policy prescribes specific stormwater management standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMPs) in the stormwater management design. The Policy is administered locally pursuant to MGL Ch. 131, s. 40.

A description of the Project's anticipated compliance with the Standards is outlined 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 proposed design will comply with this Standard. The design does not propose new stormwater conveyances and no new untreated stormwater will be directly discharged to, nor will erosion be caused to wetlands or waters of the Commonwealth as a result of stormwater discharges related to the Project.

Standard #2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

Compliance: The proposed design will comply with this Standard to the maximum extent practicable. The existing peak discharge rate will be met or will be decreased as a result of the improvements associated with the Project.

Standard #3: Loss of annual recharge to groundwater shall be eliminated or 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. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Compliance: The Project will comply with this standard to the maximum extent practicable.

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:

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 proposed design will comply with this standard. Within the Project's limit of work, there will be mostly roof, landscaping, paved pedestrian areas, and paved driveway. Runoff from paved areas that would contribute unwanted sediments or pollutants to the existing storm drain system will be collected by deep sump, hooded catch basins and conveyed through water quality units before discharging into the BWSC system.

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 DEP 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 thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Compliance: The proposed design will comply with this standard. The proposed design will include source control, pollution prevention and pretreatment practices, as necessary.

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 DEP 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: Not Applicable. The Project is not within an outstanding resource 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 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 is a redevelopment and will comply with this standard.

Standard #8: A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

Compliance: The design will comply with this standard. A plan to control temporary construction-related impacts including erosion, sedimentation, and other pollutant sources during construction and land disturbing activities will be developed and implemented.

Standard #9: A long-term operation and maintenance (O&M) plan shall be developed and implemented to ensure that stormwater management systems function as designed.

Compliance: The Project will comply with this standard. An O&M Plan including long-term BMP operation requirements will be prepared for the Project and will assure proper maintenance and functioning of the stormwater management system.

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

Compliance: The Project will comply with this standard. There will be no illicit connections associated with the Project. Temporary construction dewatering will be conducted in accordance with applicable BWSC and MWRA requirements, as necessary.

7.5 ELECTRICAL SERVICES

Eversource owns the existing above-grade electrical system in the in the Public Ways of Washington Street, the Arborway, and Orchardhill Road, as well as the below-grade electrical system in Washington Street and the Arborway. It is expected that adequate service is available in the existing electrical system for the Project improvements. The Proponent will work with Eversource to determine the infrastructure improvements needed and confirm adequate system capacity for the Proposed Project as the design is finalized.

The Proponent is committed to taking an integrated and comprehensive approach to energy planning which is sensitive to high and rising energy prices and growing concern over global climate change. The highest priority, and most cost-effective approach, is to make the Project's buildings energy efficient. In addition, as the Project's electric load and energy requirements are calculated and assessed, the Proponent will undertake an energy planning process, working closely with the City and Eversource.

7.6 TELECOMMUNICATIONS SYSTEM

There is an existing above-grade telecommunication system to provide telephone, cable and data services in the in the Public Ways of Washington Street, the Arborway, and Orchardhill Road with service provided by private telecommunication companies. It is expected that adequate service is available in the existing system for the Project improvements. The Proponent will work with the private telecommunication companies to

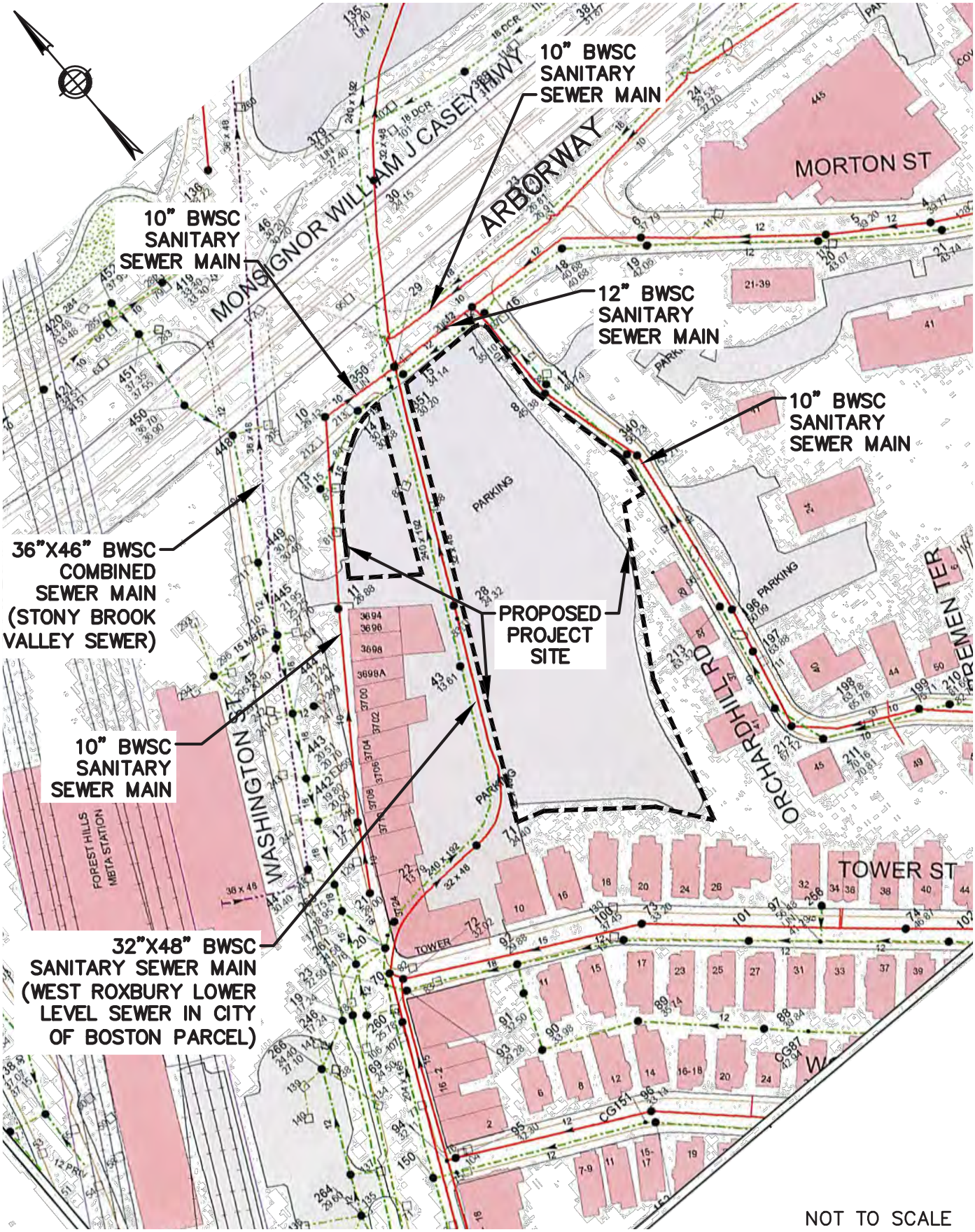
determine the infrastructure improvements needed and confirm adequate system capacity for the Project, coordinate service connection locations, and obtain appropriate approvals.

7.7 NATURAL GAS SYSTEM

National Grid owns the existing underground gas system in the Public Ways of Washington Street, Morton Street, and Orchardhill Road. It is expected that adequate service is available in the existing system for the Project. The Proponent will work with National Grid to determine the infrastructure improvements needed and to confirm adequate system capacity for the Project as the design is finalized. As noted above with respect to electricity, the Proponent will take a comprehensive and integrated approach to energy planning, one which will also include working closely with the City and National Grid.

7.8 UTILITY PROTECTION DURING CONSTRUCTION

Existing public and private infrastructure located within any public or private right-of-way shall be protected during construction. The installation of proposed utilities within a public way will be in accordance with the BWSC, Boston Public Works Department, the Dig-Safe Program, and applicable utility company requirements. Specific methods for construction of proposed utilities where they are near or within existing water, sewer, and drain facilities will be reviewed by the BWSC as part of the Site Plan Review Process. The necessary permits will be obtained before the commencement of work.



Jamaica Plain, Massachusetts

Figure 7-1
BWSC Sewer System Map
Source: Nitsch Engineering, 2016

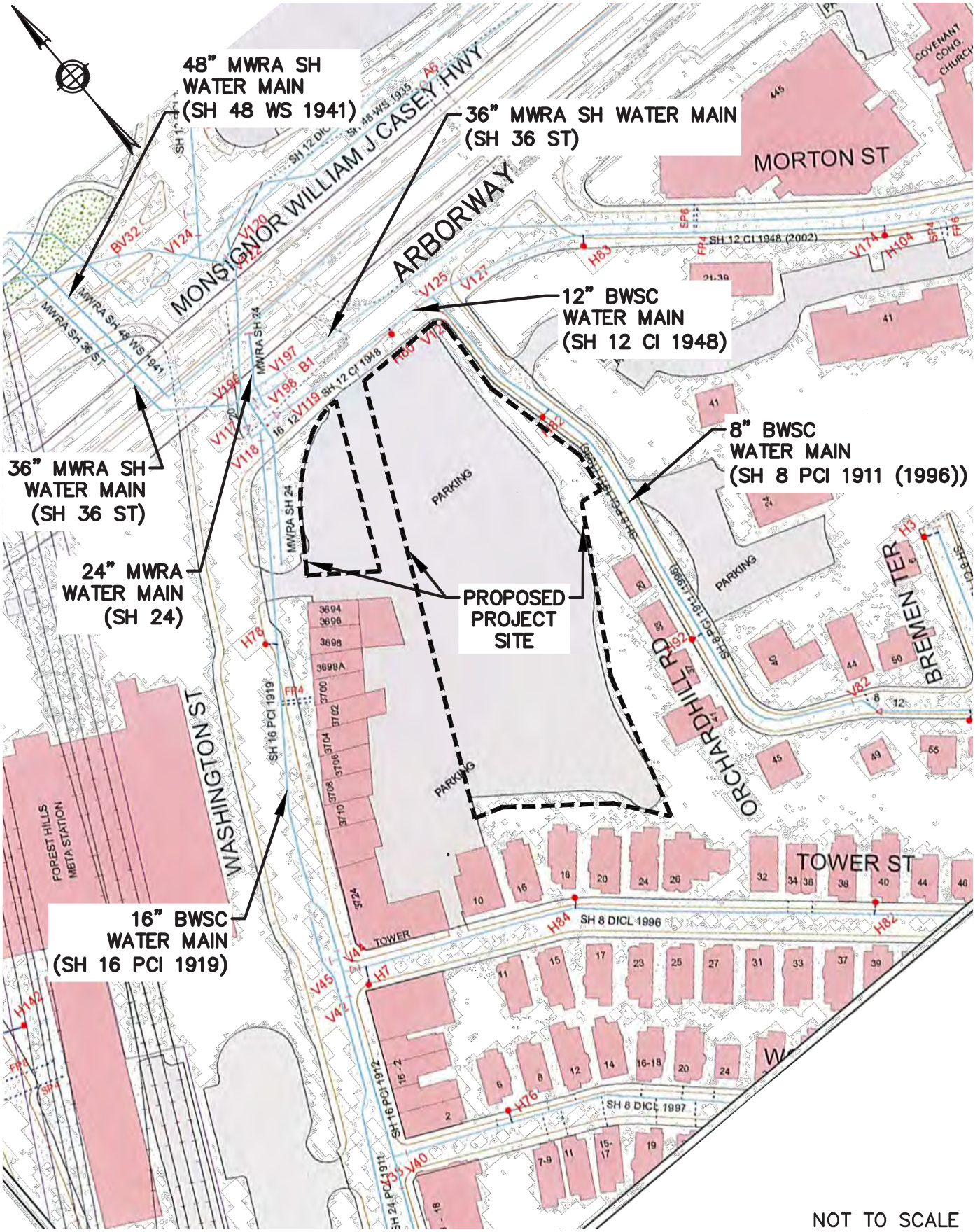


Figure 7-2
BWSC Water System Map
Source: Nitsch Engineering, 2016

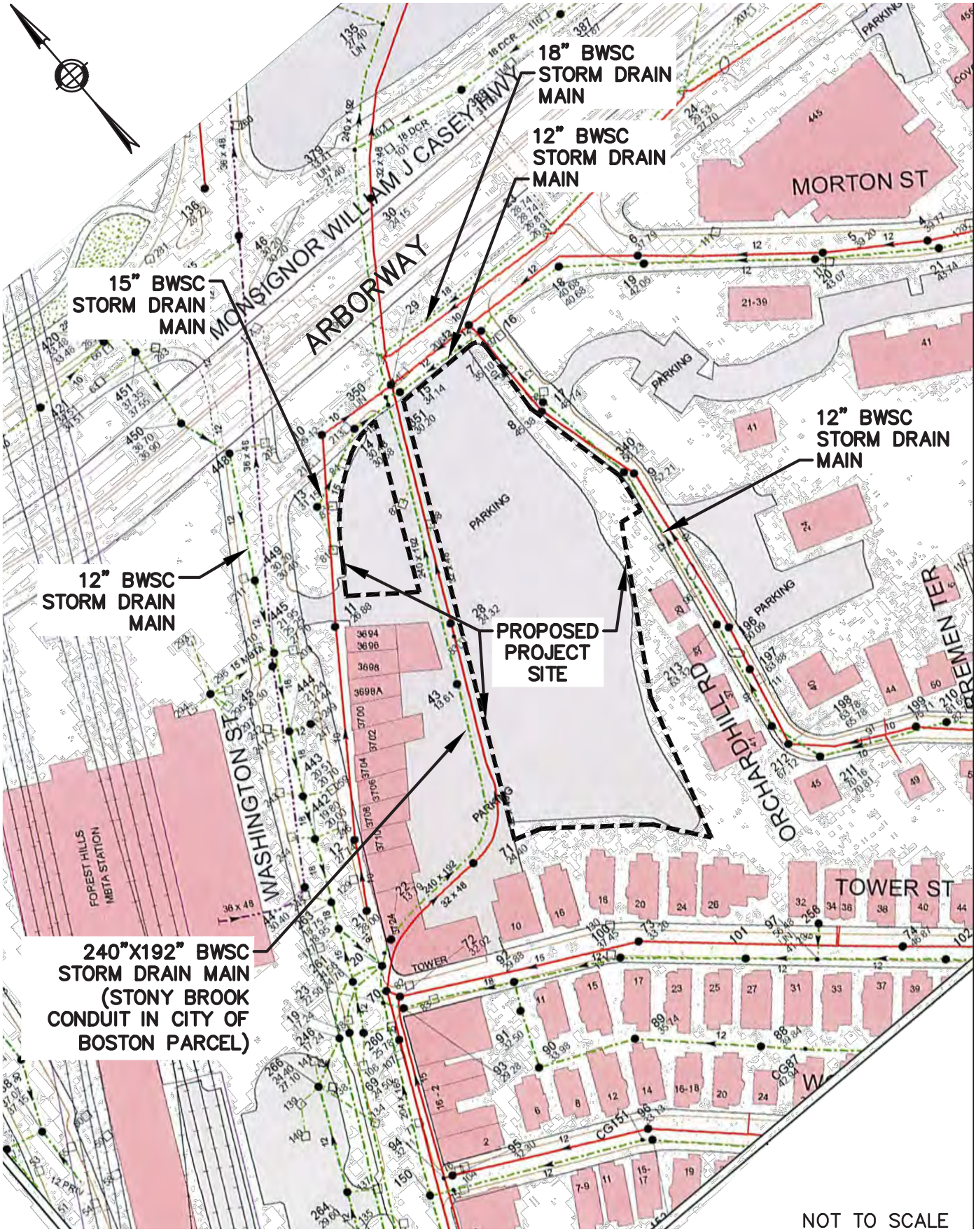


Figure 7-3
BWSC Drain System Map
Source: Nitsch Engineering, 2016

Appendix A

CLIMATE CHANGE CHECKLIST

A.1 - Project Information

Project Name:	**Residences at Forest Hills**
Project Address Primary:	**Washington Street (Arborway and Forest Hills)**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**Jack Englert / Project Manager / Criterion Development Partners / jenglert@criteriondp.com / 781- 890- 5600**

A.2 - Team Description

Owner / Developer:	**Criterion Development Partners**
Architect:	**ICON Architecture, Inc.**
Engineer (building systems):	**Wozny Barber & Associates**
Sustainability / LEED:	**TBD**
Permitting:	**Fort Point Associates**
Construction Management:	**TBD**
Climate Change Expert:	**TBD**

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

List the principal Building Uses:	**Residential, Retail**
List the First Floor Uses:	**Retail, Lobby, Amenity Spaces, Residential Units, Parking, Bike Storage**

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

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	***88,996 sf***	Building Area:	***280,000 sf***
Building Height:	***69'***	Number of Stories:	***6 Floors***
First Floor Elevation (reference Boston City Base):	***38.12' Elev.***	Are there below grade spaces/levels, if yes how many:	*Yes / **No***

A.5 - Green Building

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

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

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

Registered:	*Yes / **No***	Certified:	*Yes / **No***

A.6 - Building Energy

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

Electric:	*106 (kW)*	Heating:	*.56 (MMBtu/hr)*
What is the planned building Energy Use Intensity:	*32,933 (kbut/SF or kWh/SF)*	Cooling:	*3.6 (Tons/hr)*

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

Electric:	*45 (kW)*	Heating:	*0 (MMBtu/hr)*
		Cooling:	*0 (Tons/hr)*

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

Electrical Generation:	*60 (kW)*		Fuel Source:	X Diesel
System Type and Number of Units:	Combustion Engine	Gas Turbine	Combine Heat and Power	*1 (Units)*

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	**50 Years**	75 Years

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

Select most appropriate:	10 Years	25 Years	**50 Years**	75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	10 Years	25 Years	**50 Years**	75 Years

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

7/91	*Deg.*

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

TBD *Deg.*	*Days*	*Events / yr.*

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

TBD *Days*	*Events / yr.*

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

TBD *Inches / yr.*	***4*** *Inches/hr*	*Events / yr.*

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

TBD *Peak Wind*	*Hours*	*Events / yr.*

B.2 - Mitigation Strategies

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

Building energy use below code:	***22*** *%*
How is performance determined:	Energy Modeling in accordance with ASHRAE 90.1-Appendix G

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

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

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

Roof:	*R* = **49**	Walls / Curtain Wall Assembly:	*R* = **20 + 3.8ci**
Foundation:	*R* = **10**	Basement / Slab:	*R* = **10**
Windows:	*U* = **.32**	Doors:	*U* =**.35**

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

	On-site clean energy / CHP system(s)	Building-wide power dimming	Thermal energy storage systems	Ground source heat pump
	On-site Solar PV	On-site Solar Thermal	Wind power	**None**
Describe any added measures:	**High Eff HVAC equip for all units (15 SEER for AC units)** **90+ percent AFUE combined HW and heat appliances (Navien Systems)**			

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

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

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

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

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

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

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

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

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

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

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

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

C - Sea-Level Rise and Storms

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

C.1 - Location Description and Classification:

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

	*Yes / **No***

Describe site conditions?

Site Elevation – Low/High Points:	***Low: El. 39.5'*** ***High: El. 60.0'***

Building Proximity to Water:	***4 miles***

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

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

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

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

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

4 miles

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

C - Sea-Level Rise and Storms

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

C.2 - Analysis

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

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

C.3 - Building Flood Proofing

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

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

Flood Proof Elevation:	*Boston City Base Elev.(Ft.)*	First Floor Elevation:	*Boston City Base Elev. (Ft.)*

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

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

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

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

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

Yes / No

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

Yes / No		If yes, to what height above 100 Year Floodplain:	*Boston City Base Elev. (Ft.)*

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

	Yes / No
If Yes, describe:	

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

	Yes / No	If Yes, for how long:	*days*

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

C.4 - Building Resilience and Adaptability

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

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

Select appropriate:	*Yes / No*	Hardened / Resilient Ground Floor Construction	Temporary shutters and or barricades	Resilient site design, materials and construction

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

Select appropriate:	*Yes / No*	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
Describe additional strategies:				

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

Select appropriate:	*Yes / No*	Solar PV	Solar Thermal	Clean Energy / CHP System(s)
		Potable water storage	Wastewater storage	Back up energy systems & fuel
Describe any specific or additional strategies:				

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

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

Appendix B

ACCESSIBILITY CHECKLIST

Article 80 | ACCESSIBILITY CHECKLIST

Project Information

Project Name:	The Residences at Forest Hills
Project Address Primary:	3694 Washington Street (Arborway and Forest Hills)
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Jack Englert / Project Manager / Criterion Development Partners / jenglert@criteriondp.com / 781- 890- 5600

Team Description

Owner / Developer:	Criterion Development Partners
Architect:	ICON Architecture, Inc
Engineer (building systems):	Wozny Barber & Associates
Sustainability / LEED:	TBD
Permitting:	Fort Point Associates
Construction Management:	TBD

Project Permitting and Phase

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

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

Article 80 | ACCESSIBILITY CHECKLIST

Building Classification and Description

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

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

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building:

The Project is designed in three wood-framed buildings. Buildings A and B will be five to six-story residential buildings with parking below. Building C be a will be a six-story building with residential units comprising the upper floors, and retail and dining space on the ground floor facing Washington Street. The ground floor of Building A will provide a combination of residential amenities, an outdoor terrace, and residential units. Building B combines three-bedroom townhouses facing the open courtyard with a Bicycle Repair facility on the northern end of the building facing the Arborway. The Building B Entry Lobby is located internal to the Project Site. Building C accommodates up to 6,000 sf of commercial space with a ground level entry lobby for the residential units above.

Site Area:	***88,996 sf***	Building Area:	***280,000 sf***
Building Height:	***69'***	Number of Stories:	***6 Floors***
First Floor Elevation:	***38.12' Elev.***	Are there below grade spaces:	*Yes / **No***

Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the development neighborhood and identifying characteristics.	The Project Site is currently occupied by a 300+ space surface paid parking lot. The Project Site is located across the street from Forest Hills Station. The immediate surroundings include the new Casey Arborway reconstruction. This ongoing reconstruction will include at-grade vehicle intersections and new public greenspace. Low density commercial (one to four stories) and residential uses abut the site directly. The Project Site is located in a diverse neighborhood offering a mix of different housing typologies and business types. Numerous transportation options are within a quarter mile radius of the Project Site.
List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	The Project is directly across Washington Street from the lower bus way of Forest Hills Station, which is an accessible station.
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	Massachusetts Department of Public Health, University of Massachusetts Medical School (JP Campus), and Lemuel Shattuck Hospital are all in close proximity to the Project Site.
Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	No. The Project Site abuts the new Arborway with bike and pedestrian paths. The West Roxbury Municipal Court, Curtis Hall Community Center, and Archdale Community Center are within one mile pf the Project Site.

Surrounding Site Conditions – Existing:

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

Are there sidewalks and pedestrian ramps existing at the development site?	No. Currently, the perimeter of the Project Site is under construction. The Arborway improvements will be complete in Spring of 2018, with full beneficial use anticipated in Fall of 2017. Currently, there are minimal sidewalks and temporary walkways.

If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	N/A
Are the sidewalks and pedestrian ramps existing-to-remain? If yes, have the sidewalks and pedestrian ramps been verified as compliant? If yes, please provide surveyors report.	N/A
Is the development site within a historic district? If yes, please identify.	The Project Site is not within a historic district.

Surrounding Site Conditions – Proposed

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

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	The Project Site is bounded by the ongoing Casey Arborway improvements with improved links to pedestrian and bikeway. Along the Building C facade, the retail level will be set back under a colonnade to encourage foot traffic along the front of the building, facing Washington Street and the Arborway. Between buildings B and C, over the BWSC property, a planted courtyard with accessible walkways will invite pedestrians to the main entries of buildings B and C. Along the Project Site vehicle entry, an accessible sidewalk will connect Washington Street directly to the landscaped entry courtyard. (Interior walkways are for site access and would not be required to meet Complete Streets, but will provide accessible routes.)
If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	N/A
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	Along the edge of the Project Site, abutting the new Arborway improvements, the sidewalk colonnade will be 5 feet wide. At the walkway connection to Washington Street, two 5 foot wide walkways on each side of parallel parking and a two-way entry drive will provide access to the Project Site.

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?	**TBD. Materials for the walkways will meet ADA and MAAB for accessibility.**
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?	**No.**
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	**TBD. Sidewalk cafes may be programmed for the courtyard-side (east side) of Building C.**
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?	**The outdoor seating feasibility and dimensions are TBD.**

Proposed Accessible Parking:

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

What is the total number of parking spaces provided at the development site parking lot or garage?	**The Project includes 130 garage spaces and 10 surface spaces.**
What is the total number of accessible spaces provided at the development site?	**The Project includes 4 car accessible spaces and one van accessible space, for a total of 5 accessible parking spaces.**
Will any on street accessible parking spaces be required? If yes, has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	**N/A**

Where is accessible visitor parking located?	**Accessible visitor parking will be located in the drop-off courtyard.**
Has a drop-off area been identified? If yes, will it be accessible?	**Yes.**
Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	**See attached.**

Circulation and Accessible Routes:

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

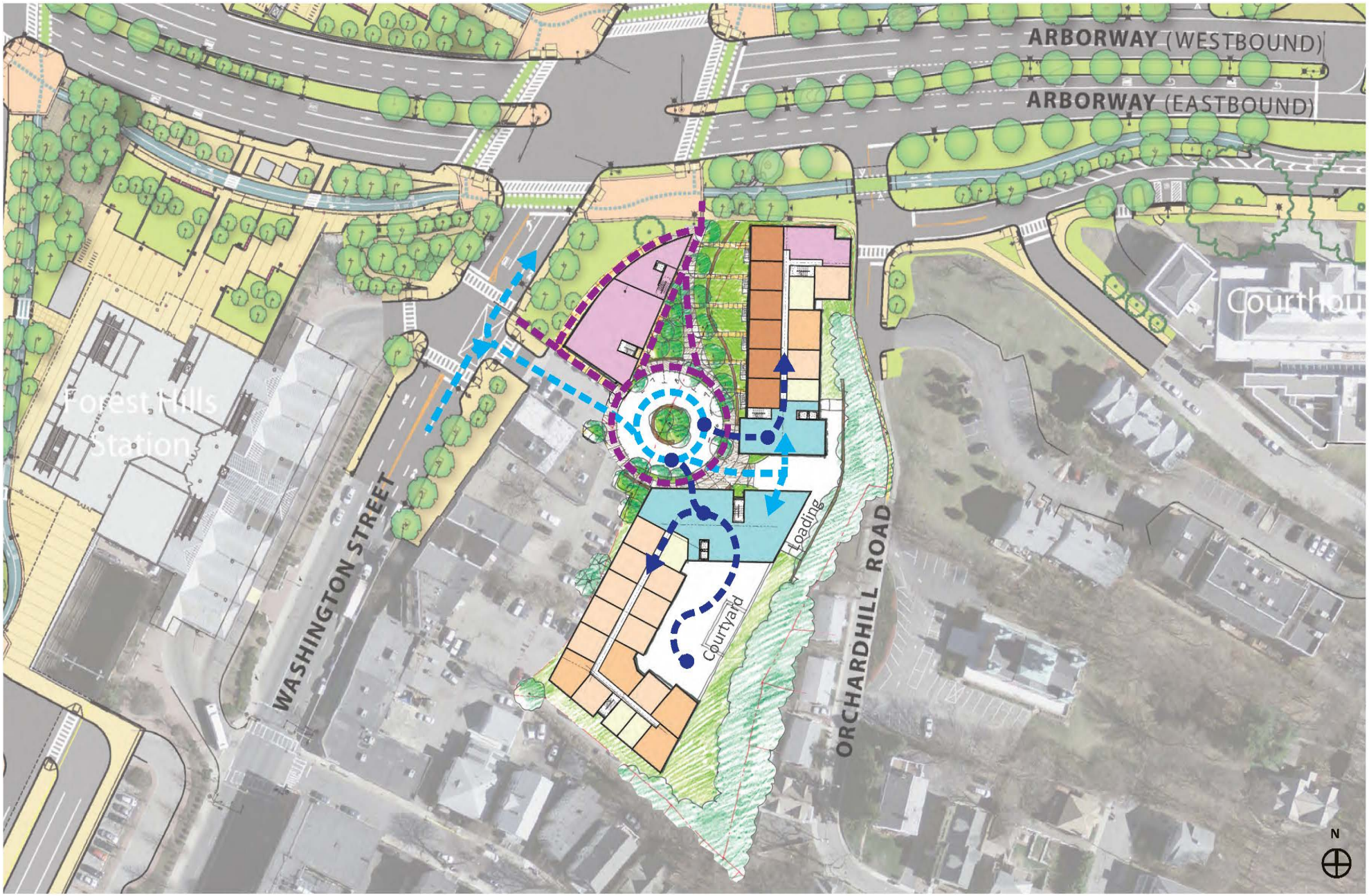
**Visit-ability – Neighbors ability to access and visit with neighbors without architectural barrier limitations*

Provide a diagram of the accessible route connections through the site.	**See attached.**
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	**All common spaces in all buildings will be accessible and visitable. All units will meet MAAB regulations and be visitable, excluding multi-level duplex apartments.**
Are the accessible entrance and the standard entrance integrated?	**Yes, a ramp and stairs will be provided.**
If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	**A patio over podium parking will be used as outdoor common space for residents' use. See attached diagram.**
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	**TBD**

Accessible Units: (If applicable)

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

What is the total number of proposed units for the development?	**Approximately 252 units**
How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	**The Project is comprised of rental apartments, and will include 20% affordable units of mixed type.**
How many accessible units are being proposed?	**13 apartments will be accessible (5% of the total)**
Please provide plan and diagram of the accessible units.	**See attached.**
How many accessible units will also be affordable? If none, please describe reason.	**The Project will include three accessible units.**
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes,** please provide reason.	**All units except the duplex units will be visitable.**
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	**No.**
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	**N/A**



The Residences at Forest Hills

E-ICON ARCHITECTURE

c | d | p

Figure 1-7
Pedestrian and Vehicular Access

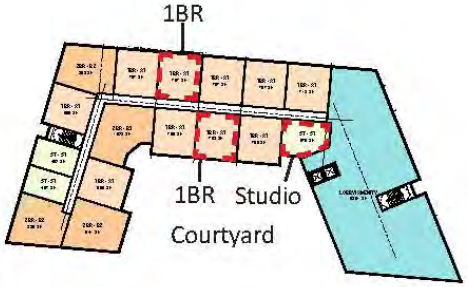
Sixth Floor / Roof Plan

Third Floor

Fifth Floor

Second Floor

Fourth Floor



Ground Floor

BUILDING A

Barrier Free Group 2 Unit

	Studio	1BR	2BR	3BR	Totals
Total Unit	58	125	58	11	252
	23%	±50%	23%	4.40%	100%
Barrier Free Unit	3	6	3	1	13

The Residences at Forest Hills

E-ICON ARCHITECTURE

c | d | p

Figure 1-8a
Accessible Unit Diagram

Sixth Floor / Roof Plan

Third Floor

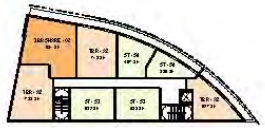
Fifth Floor

Second Floor

Fourth Floor

Ground Floor

BUILDING B



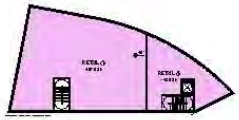
Sixth Floor / Roof Plan

Third Floor

Fifth Floor

Second Floor

Fourth Floor



Ground Floor

BUILDING C

Barrier Free
Group 2 Unit

The Residences at Forest Hills

ICON ARCHITECTURE | c d p

Figure 1-8b
Accessible Unit Diagram

Appendix C

TRANSPORTATION TECHNICAL APPENDIX

TRANSPORTATION APPENDIX

The Transportation Technical Appendix is available under separate cover.

Appendix D

LETTER OF INTENT

c | d | p

July 22, 2016

Mr. Brian P. Golden, Director
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Re: Letter of Intent to File Project Notification Form
The Residences at Forest Hills
Washington Street, Jamaica Plain Neighborhood District

Dear Mr. Golden:

Please accept this letter as a Letter of Intent under Article 80 of the Boston Zoning Code, ("Code") submitted to the Boston Redevelopment Authority ("Authority") pursuant to the Executive Order entitled: "An Order Relative to the Provision of Mitigation by Development Projects in Boston" for the filing of a Project Notification Form ("PNF") for The Residences at Forest Hills "(Proposed Project").

Criterion Development Partners ("CDP") proposes to construct a mixed-use residential and retail development at the corner of Washington Street and the Arborway in the Forest Hills section of Jamaica Plain. The development site consists of three assessor parcels (Parcels: 1103720010, 1103719000, and 1103718000) containing approximately 91,730 square feet of land and is presently occupied by a 300+ space parking lot ("Project Site"). CDP proposes to transform this 2-acre asphalt lot into a vibrant, pedestrian-friendly, transit-oriented, mixed-use development. The Project Site is bounded by the Arborway to the north, Orchardhill Road and residences to the east, commercial and residential uses to the south, and commercial uses and Forest Hills Station to the west. The Project Site is bisected by the Boston Water and Sewer Commission Stony Brook Conduit running generally in a north/south direction. With the exception of a vegetated hillside along the easterly perimeter, which we intend to protect, the Project Site is almost exclusively hardscape. The Project Site currently serves as a parking lot used primarily by commuters using the Forest Hills MBTA Station located across Washington Street. Access to the lot is provided from Washington Street and the Arborway.

The Residences at Forest Hills will provide approximately 260 rental apartments in three wood-frame buildings over a single-level garage with approximately 126 structured parking spaces and 10 surface parking spaces. The garage will include bicycle storage areas and charging stations for electric cars. The unit mix will include studio, one-, two- and three-bedroom apartments and three-bedroom townhouses. The Proposed Project will provide affordable units in excess of that

required by the City's December 2015 Inclusionary Development Policy. The Proposed Project includes activated ground level space in the buildings abutting Washington Street and the Arborway. Approximately 5,500 square feet of street-front retail/restaurant space for local merchants will be provided to complement existing neighborhood shopping opportunities along Washington Street.

The Proposed Project will conform to Article 37 of the Boston Zoning Code - Green Building and Climate Resiliency Guidelines with a minimum goal of LEED Silver certification. As a transit-oriented development located in close proximity to the multimodal Forest Hills Station and the Southwest Corridor Park, the Proposed Project will include Zipcar spaces and a bike-share facility to serve both residents of the project as well as neighbors and area commuters. The Proposed Project constitutes a large project under Article 80B of the Code and is subject to Large Project Review. In accordance with provisions of Section 80B-5.4 of the Code, CDP intends to file a PNF with the BRA.

CDP has spent several months engaging area residents and seeking input on the Proposed Project. CDP's outreach efforts included meetings with the West Roxbury Courthouse Neighborhood Association and representatives of the commercial buildings abutting the site on Washington Street and Tower Street. In April, we sent a letter of introduction describing the Proposed Project to approximately 230 homeowners on Orchardhill Road, Bremen Terrace, Lennoco Road, Tower Street, Woodlawn Street, Asticou Road, Yale Terrace and Morton Street. We received approximately 10 emails offering comments and/or requests for additional information. We responded to each email and met one-on-one with individual residents upon request. We also attended a gathering of 14 neighbors from Bremen Terrace and Orchardhill Road. The information received from the community regarding the neighborhood and the context of the site has been invaluable. We have already modified our original site design to be more responsive to the neighborhood and will continue to do so throughout the review process. CDP is committed to engaging the community and strongly believes that we can improve our proposal by listening to and responding to those who know the community best. We look forward to working with the BRA, City agencies and the Jamaica Plain/Forest Hills community during the Article 80 review of the Proposed Project.

Thank you for your consideration of this letter.

Sincerely,

John J. Englert

cc: Jonathan Greeley - BRA
Phil Cohen – BRA
Pretlow Riddick - CDP