University Place Residences

Dorchester, Massachusetts

Expanded Project Notification Form

April 5, 2013

submitted to **Boston Redevelopment Authority**

submitted by **University Place Residences LLC**
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Chapter 1

PROJECT SUMMARY

CHAPTER 1: PROJECT SUMMARY

1.1 PROJECT IDENTIFICATION

Project Name:	University Place Residences
Address/Location:	140-144 Mount Vernon Street, Dorchester, MA 02125
Assessor's Parcel Numbers:	1303448200, 1303449000, and 1303452000

1.2 PROJECT SITE

University Place Residences LLC (the "Proponent") proposes to construct the University Place Residences (the "Project") at 140-144 Mount Vernon Street on a 66,885 square foot parcel (the "Site") located on the Columbia Point peninsula near the shoreline of Dorchester Bay. The Site is relatively flat and consists of a surface parking lot. The Site is bounded by Mount Vernon Street and the William J. Day Boulevard Connector to the west, William J. Day Boulevard to the north, an existing office building owned by an affiliate of the Proponent to the east (the "Office Building"), and the former Bayside Expo and Conference Center ("Bayside Expo Center") owned by the University of Massachusetts Building Authority ("UMass") further to the east and to the south. See Figure 1-1, Locus Map, and Figure 1-2, Aerial View of Existing Site.

1.3 PROJECT SUMMARY

The Project will include a new 198,603 gross square foot (gsf), 6-story building that will contain 184 rental apartment units, ground floor commercial space, common areas, and underground parking. The new building will be constructed on a portion of the existing parking lot toward the southwest corner of the Site. The building's footprint will be approximately 28,000 sf and its height will be 69 feet (75 feet to the mechanical enclosure). See Figure 1-3, Project Site Plan.

In accordance with the June 2011 Columbia Point Master Plan, the Project will bring much needed housing to the area to complement the surrounding institutional and office uses. It will contain a combination of studio, one-bedroom, and two-bedroom rental apartments, including 24 affordable units. The new building will provide street frontage along Mount Vernon Street and the William J. Day Boulevard Connector, creating a pedestrian-friendly environment and sense of human scale that is lacking in the area currently. The Project will meet Article 37 of the City of Boston Zoning Code and will be Leadership in Energy and

Environmental Design (LEED) certifiable, incorporating a range of sustainable design and construction features.

The new residential building will contain 76 underground parking spaces. In addition, 7 surface parking spaces (including 2 accessible spaces and 2 van accessible spaces) will be provided on the Site behind the new residential building. Loading and delivery will take place at the north side of the new building and accessed through the parking lot and away from the principal façades of the building.

The Project will contribute to the continued revitalization of Columbia Point by creating new residential and commercial space situated to take advantage of the Site's excellent transit, cycling, and roadway connections to downtown Boston and other destinations around the city. The Project's mix of uses will also generate new pedestrian traffic that aligns with the City's goal of redesigning the area, particularly Mount Vernon Street, in line with its recently adopted Complete Streets Guidelines.

The Project will include a new, attractive, approximately 30,000 sf landscaped open space. Pedestrian access to the new building will be provided along Mount Vernon Street, and an existing fence that currently obstructs access to the Site and Mount Vernon Street will be removed. Plantings and other landscape features will enhance the overall character of the Site, reducing the amount of paved surface to increase permeability and create a softer, greener environment.

1.4 PUBLIC AND COMMUNITY BENEFITS

The Project will:

- Allow for construction of a new residential building, which will bring more residents to the area and add to the diversity of the housing stock through the creation of 184 new two-bedroom, one-bedroom, and studio apartments, including 24 affordable units;
- Improve the urban design characteristics of the area by constructing a human-scaled building along the street and eliminating a large expanse of surface parking;
- Enhance the pedestrian environment along Mount Vernon Street by removing barriers such as fencing between the property and Mount Vernon Street and creating a continuous green space in front of the new building;
- Add ground-floor commercial space to activate the public realm;

- Facilitate Transit Oriented Development (TOD) by increasing residential density in close proximity to the multi-modal JFK/UMass MBTA Station and by accommodating bicycle storage, electric car charging, and zipcar parking;
- Support the City's goals for a sustainable future through the development of an energy-efficient and environmentally friendly building that will be LEED certifiable;
- Provide approximately 200 construction-related jobs and ten permanent jobs and stimulate the local and regional economy.

1.5 SUMMARY OF REQUIRED 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 Redevelopment Authority	Article 80B Large Project Review Cooperation Agreement Boston Residents Construction & Employment Plan Certificate of Compliance with Article 80
Boston Civic Design Commission	Recommendation to the BRA Board
Boston Zoning Commission	Planned Development Area Approval
Boston Fire Department	Flammable Storage Permit Garage Permit from Committee on Licenses
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 Conservation Commission	Order of Conditions
Boston Parks Commission	Approval for Work within 100 Feet of Parkland
State	
Massachusetts Department of Environmental Protection	Source Registration for Sewer Discharge Source Regulation for Emergency Generator Notification Prior to Construction or Demolition Response Action Outcome Statement
Massachusetts Board of Elevator Regulations	Elevator Permit for Installation Elevator Inspection Certificate

Agency	Approval
Federal	
Federal Emergency Management Agency	Conditional Letter of Map Revision based on Fill-CLOMR-F
Environmental Protection Agency	National Pollutant Discharge Elimination System Permit Notice of Intent for Construction Stormwater

1.6 PROJECT TEAM

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University Place Residences
Dorchester, Massachusetts

Figure 1-1
Locus Map
Source: USGS

University Place Residences
Dorchester, Massachusetts

Figure 1-2
Aerial View of Existing Site
Source: Google, 2011

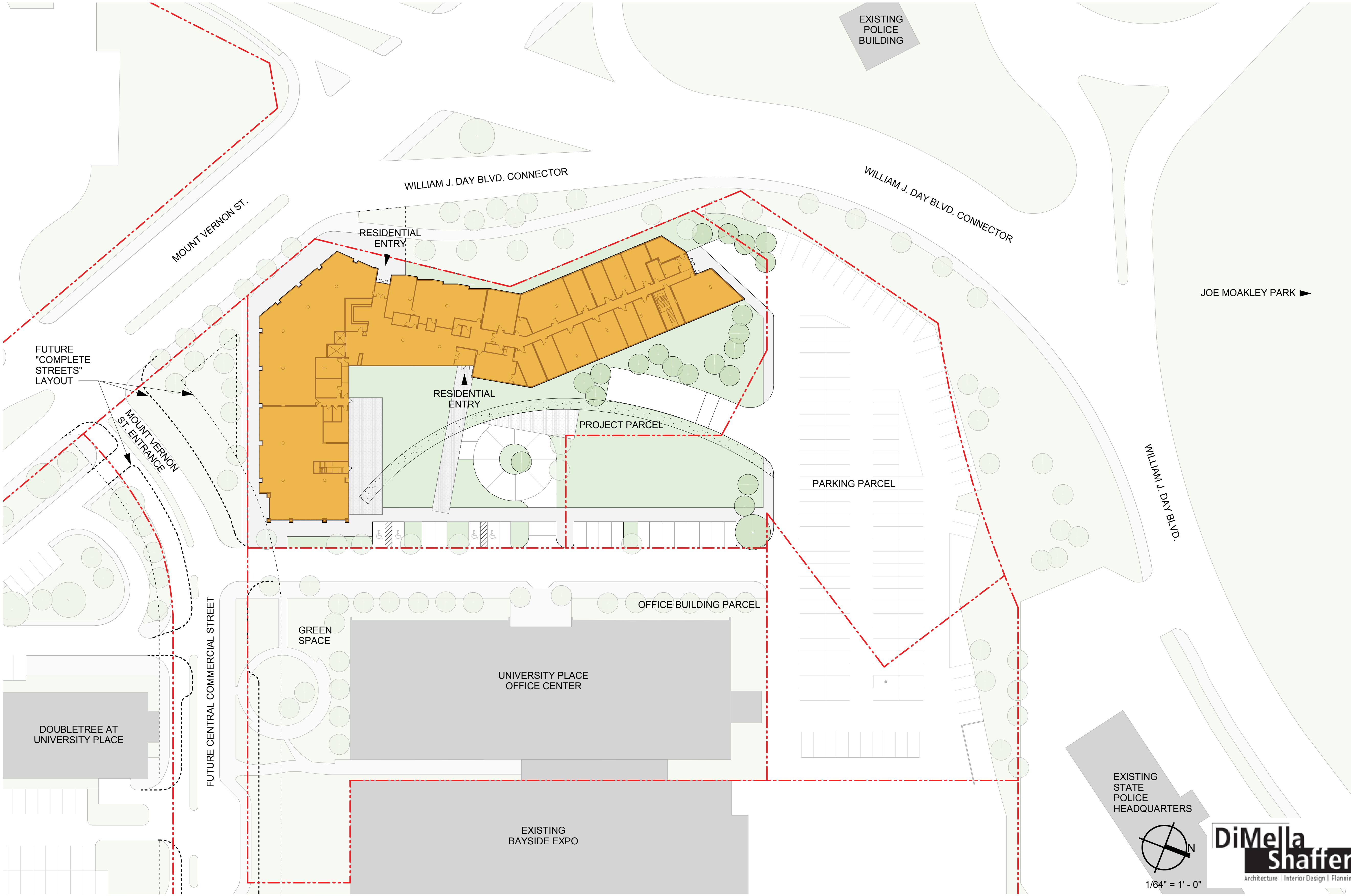


Figure 1-3
Project Site Plan
Source: DiMella Shaffer Architects, 2013

Chapter 2

PROJECT DESCRIPTION

CHAPTER 2: PROJECT DESCRIPTION

2.1 PROJECT SITE AND SURROUNDINGS

The Proponent proposes to redevelop a 66,885 sf parcel (the "Site") bounded by Mount Vernon Street and the William J. Day Boulevard Connector to the west, William J. Day Boulevard to the north, the University Place Office Center owned by an affiliate of the Proponent to the east (the "Existing Office Building"), and the former Bayside Expo and Conference Center ("Bayside Expo Center") owned by the University of Massachusetts Building Authority ("UMass") further to the east and to the south. See Figure 2-1, Oblique View of Existing Site and Figure 2-2, Existing Conditions Survey.

Contiguous parcels owned by Corcoran Jennison will be re-subdivided into three new parcels to allow for redevelopment. In addition to the Site, a second parcel (the "Office Building Parcel") will contain the 5-story, approximately 153,683 gsf Existing Office Building, and a third parcel (the "Parking Parcel") will contain existing surface parking. Subdivision will not preclude future development on the Parking Parcel. Further to the east, beyond the Office Building Parcel, is property owned by UMass that contains the former Bayside Expo Center and open space, which is mostly comprised of a surface parking lot. To the south of the Site is a narrow portion of a parcel owned by UMass, which includes an easement for the primary entrance to the Site (the "Mount Vernon Street Entrance"), and another parcel that includes an existing hotel, DoubleTree at University Place, owned by an affiliate of the Proponent. A State Police Headquarters facility is located to the north and is accessed by William J. Day Boulevard. The Site enjoys certain additional easements across the former Bayside Expo Center parcel, including access to William J. Day Boulevard, and is encumbered by certain cross easements and utility easements. See Figures 2-3 to 2-5, Existing Conditions Photographs.

The Project is located less than one quarter of a mile from the JFK/UMass MBTA Station. It is primarily accessed from Mount Vernon Street, has a secondary access from William J. Day Boulevard, and is in close proximity to Route I-93. Nearby open space and recreational resources include Carson Beach and Joe Moakley Park to the north, and the Harborwalk around Columbia Point. The Site is also in close proximity to the Harbor Point Apartments and the UMass Boston campus to the south.

A narrow strip of grass and trees, owned by the Department of Conservation and Recreation ("DCR"), separates the Site from Mount Vernon Street and the William J. Day Boulevard

Connector. An existing sidewalk allows pedestrians to walk along the western edge of the Site although a fence currently prevents pedestrians from accessing the Site along this road.

Along with the former Bayside Expo Center, the Site has been identified in the 2011 Columbia Point Master Plan as an area appropriate for significant new development, activation through a mix of uses, and improvements to the public realm.

2.2 PROPOSED PROJECT

The proposed Project entails the development of a new, 6-story residential building with ground floor commercial space on a portion of the existing parking lot on the Site. The building will contain 184 rental apartments, 24 of which will be affordable units. It will also include ground floor commercial spaces and common spaces for residents. The majority of parking will be provided at the subsurface level of the building with a few additional spaces at grade. The new building will be oriented to the southwestern portion of the Site and vehicular access will be provided from the south via the Mount Vernon Street Entrance off of Mount Vernon Street.

The Site does not currently provide a street wall or pedestrian-level activity. However, in the context of existing commercial and institutional uses in Columbia Point, as well as anticipated new development, the Project will provide enhanced activation and improved connections to nearby properties and public transportation.

The Site is relatively flat and is partially located in a 100-year flood plain. To minimize the likelihood of flooding and in anticipation of further sea level rise, the Site will be partially elevated by fill. Varied soil conditions due to the Site's historical use as a burn dump will require the on-site treatment of subsoils and the remediation of contaminants both on site and off site as per Massachusetts Department of Environmental Protection (DEP) regulations. A new green space will be created within the Site with direct access from the building's ground floor amenity areas and the commercial spaces.

The building footprint is 28,000 sf, covering approximately 41% of the 66,885 sf site. The total gross floor area (GFA) of the building is 168,348 sf and the Project's Floor Area Ratio (FAR) is 2.52.

Table 2-1: Project Program

Project Component	Dimensions/Count
Gross Floor Area	168,348 sf
Floor Area Ratio	2.52
Parking	76 garage spaces + 7 surface (including 2 accessible and 2 van accessible) = 83 spaces
Commercial	9,700 sf
Ground Floor Amenities	6,849 sf
Residential	184 units

2.2.1 GROUND FLOOR USES

The proposed footprint for the new residential building is approximately 28,000 sf. The building contains approximately 9,700 sf of retail at the ground floor level to the southwest along Mount Vernon Street that will activate the streetscape along this portion of the building. The ground floor will also include a mix of studio apartments, one-bedroom, and two-bedroom apartments, a central lobby, a leasing office, a conference room, an exercise facility, and common areas including bicycle storage, trash and recycling, and service functions. Commercial space will be provided along Mount Vernon Street and the Mount Vernon Street entrance. See Figure 2-6, Ground Floor Plan.

2.2.2 RESIDENTIAL UNITS

The proposed new apartments will provide a diverse mix of housing for Columbia Point that will be attractive to young, working professionals. There will be a total of 184 dwelling units that will consist of 67 studio apartments at 400-430 sf, 73 one-bedroom apartments at 660-670 sf, and 44 two-bedroom apartments at 970-1,070 sf. The dwelling units will be organized around a central corridor. The layout and shape of the floor plate are intended to provide an efficient footprint that will maximize the building's frontage on Mount Vernon Street and take advantage of views to downtown Boston, Dorchester Bay, and Joe Moakley Park. The sixth floor will vary slightly in configuration in order to accommodate an indoor/outdoor clubhouse. See Figure 2-7, Level 2 Floor Plan; Figure 2-8, Typical Upper Level Floor Plan (Levels 3-5); and Figure 2-9, Level 6 Floor Plan.

Table 2-2: Unit Mix

Level	Studio Units	One-bedroom Units	Two-bedroom Units	Total Units
01	8	3	1	12
02	12	14	9	35
03	12	14	9	35
04	12	14	9	35
05	12	14	9	35
06	11	14	7	32
Total	**67**	**73**	**44**	**184**

2.2.3 PARKING AND ACCESS

The Project removes 231 surface parking spaces from the Site (226 standard spaces, 5 accessible spaces), which are replaced by 83 total spaces, including 76 covered parking spaces and 7 surface spaces (including 2 accessible spaces and 2 van accessible spaces). The Parking Parcel will retain its current parking distinct from but adjacent to University Place Residences. All underground spaces will be for use by residential tenants. The surface-level spaces will be shared by various users.

Vehicle pick up and drop off to the building, and visitor parking will be accessed from Mount Vernon Street by a drive that is shared with the Existing Office Building and entered from a roadway on UMass property for which the Proponent has a deeded easement. A ramp behind the building to the east will provide access to the underground parking. A loading and delivery dock will be located at the northeast end of the building. A separate service room will be provided directly adjacent to the retail space and accessed to the Mount Vernon Street Entrance. See Figure 2-10, Parking Garage Plan.

2.2.4 OPEN SPACE

The existing DCR landscaped area along Mount Vernon Street will provide an inviting, pedestrian front entrance to the building. It will serve to connect residents on foot to nearby recreational and natural amenities, including Carson Beach and Joe Moakley Park. A new landscaped area of approximately 30,000 sf will be created behind the new building and in front of the Existing Office Building on the Site. Landscape elements are illustrated in Figure 2-11, Landscape Plan, and further described in Section 3.6, Landscape.

2.3 COLUMBIA POINT MASTER PLAN

The Columbia Point Master Plan was approved by the Boston Redevelopment Authority (BRA) Board in June 2011 following an extensive community process focused on creating a new vision for the area. Corcoran Jennison participated actively in the development of the plan which set forth the objectives of improving multimodal transportation access, encouraging a mix of uses including diversity in housing types, activating the public realm, making connections to Boston Harbor, and encouraging new parks and recreational amenities, all to create a "vital, sustainable path to the 21st century."

The Site on which University Place Residences will be located was identified for new development in the plan and the Project will successfully advance several of the plan's key goals. The Project will be located in the northern part of Columbia Point, which was identified in the plan as a "Gateway/Mixed Use District" appropriate for increased density. The Project will help to break down an existing "superblock" as identified in the plan and create a sense of place in accordance with the plan's principles. It will improve the pedestrian realm and include new green space in an area that is currently paved surface parking. With a mix of apartment types, it will attract new residents to the area as is encouraged by the plan. See Figure 2-12, Columbia Point Master Plan Conceptual Land Use Plan.

University Place Residences is the first new development that is visualized in the Master Plan on the east side of Mount Vernon Street. Placement of the building as close as possible to Mount Vernon Street gives shape to the space that surrounds their intersecting geometries. It also begins a pedestrian oriented street edge along Mount Vernon Street that will ultimately continue on to Harbor Point Apartments. The building placement will allow for further development of the Corcoran Jennison-owned parcels as economic conditions and market demand continue to improve.

Finally, through its LEED certifiable new building and adherence to green building principals, the Project will promote the sustainability that is identified in the Master Plan as highly desirable in this burgeoning part of the city.

2.4 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 square feet of gross floor area. The project also will be subject to review by the Boston Civic Design Commission under Article 28.

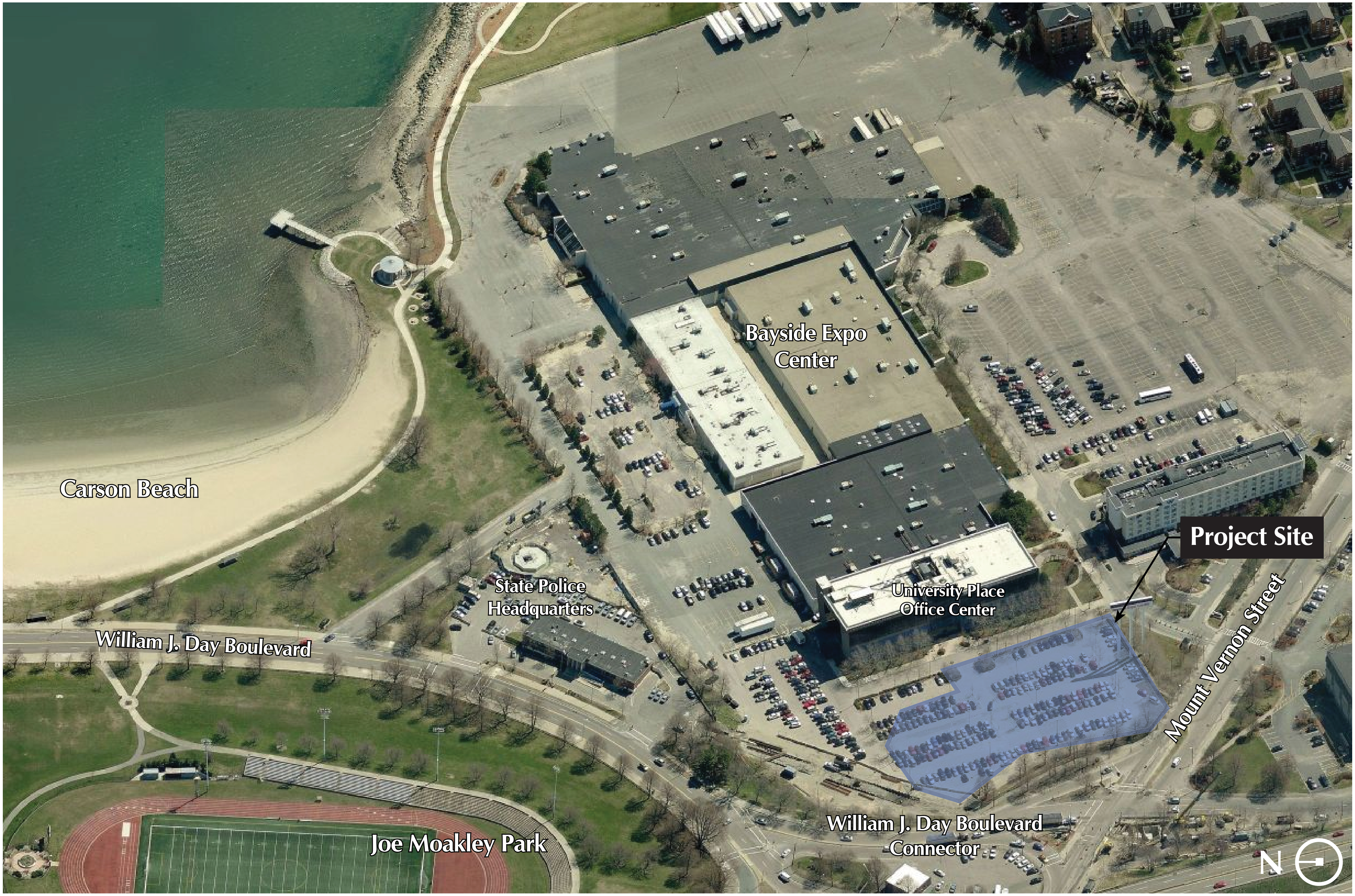
The Project is located within the Dorchester Bay/Neponset River Waterfront Subdistrict of the Harborpark District governed by Article 42A of the City of Boston Zoning Code and is designated B-1-55, Business District. In connection with the adoption of Harborpark zoning, which includes the Site, the Columbia Point area was designated as a Special Study Overlay District, in recognition of the need to undertake a comprehensive planning effort for the area. The Project is also within the Restricted Parking Overlay District. In the B-1-55 Business District, all of the uses contemplated to be included in the project are allowed, including multi-family dwelling space, retail business, retail catering and restaurant uses, entertainment uses, recreational uses, and accessory uses thereto. Parking garages and accessory parking associated with residential uses are allowed. The majority of the Site is also subject to the Greenbelt Protection Overlay District adjacent to William J. Day Boulevard.

The Project will be subject to a Planned Development Area ("PDA") Development Plan. The dimensional requirements for the Site under current zoning include a maximum FAR of 1.0 and a maximum building height of 55 feet. Based on a preliminary zoning analysis, the project will have an FAR of 2.52, exceeding 1.0, and a building height of 69 feet (75 feet including mechanicals, which are shown in Figure 2-13, Roof Plan), exceeding 55 feet. An increase in FAR and height for this area is encouraged through the stated objectives of recent planning efforts in the area. In addition, the proposed parking ratio of .52 is lower than the .75-1.25 ratio in the Boston Transportation Department recommendations. (The parking ratio is determined by dividing the total number of market rate units, which is 160, into the total number of parking spaces, which is 83.) The PDA will therefore include provisions for an increase in allowable FAR and building height and a decrease in parking ratio. It will include the parcels on which University Place Residences, the University Place Office Center, and the parking lot are located.

The project is subject to Article 37 of the Code. It will therefore be designed and constructed to be LEED certifiable. See Section 3.8, Sustainability, for a discussion of a LEED credits that the project intends to achieve.

2.5 CHAPTER 91 JURISDICTION

The Site is comprised of non-jurisdictional upland adjacent to filled (formerly flowed) tidelands. In February 2007, the Proponent filed a Request for Determination of Applicability ("RDA") with the DEP Waterways Protection Program in preparation for a project at the Bayside Expo Center. The RDA proposed a jurisdiction line based on Licenses on file with DEP and documentation of the historic mean high water line. This line is shown in red in Figure 2-14, Chapter 91 Jurisdiction. DEP approved this line in a Determination of Applicability ("DOA") issued in May 2007. This jurisdiction line supersedes any presumptive line established prior or subsequent to the issuance of the DOA. As illustrated in Figure 2-14, the Site is outside of jurisdiction and therefore not subject to the provisions of Chapter 91.



University Place Residences
Dorchester, Massachusetts

Figure 2-1
Oblique View of Existing Site
Source: Google, 2011

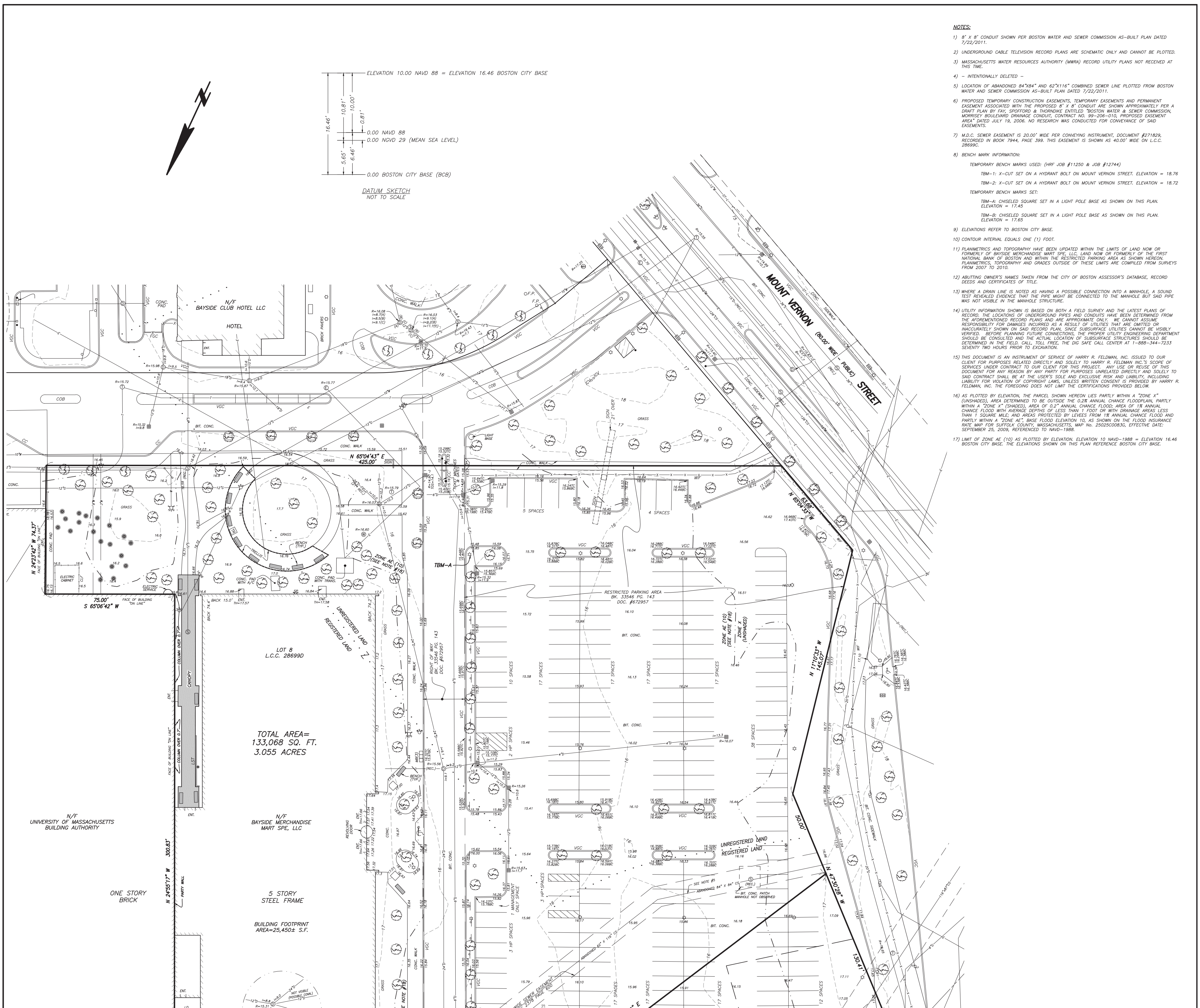


Figure 2-2
Existing Conditions Survey
Source: Feldman Professional Land Surveyors, 2012

View looking East toward the site (in background) from the JFK/UMass MBTA Station

View looking East Across Mount Vernon Street toward the Site

Figure 2-3
Existing Conditions Photographs
Source: Fort Point Associates, 2012

View looking North from Mount Vernon Street at the Site's perimeter

View of the Site's vehicular access from the South

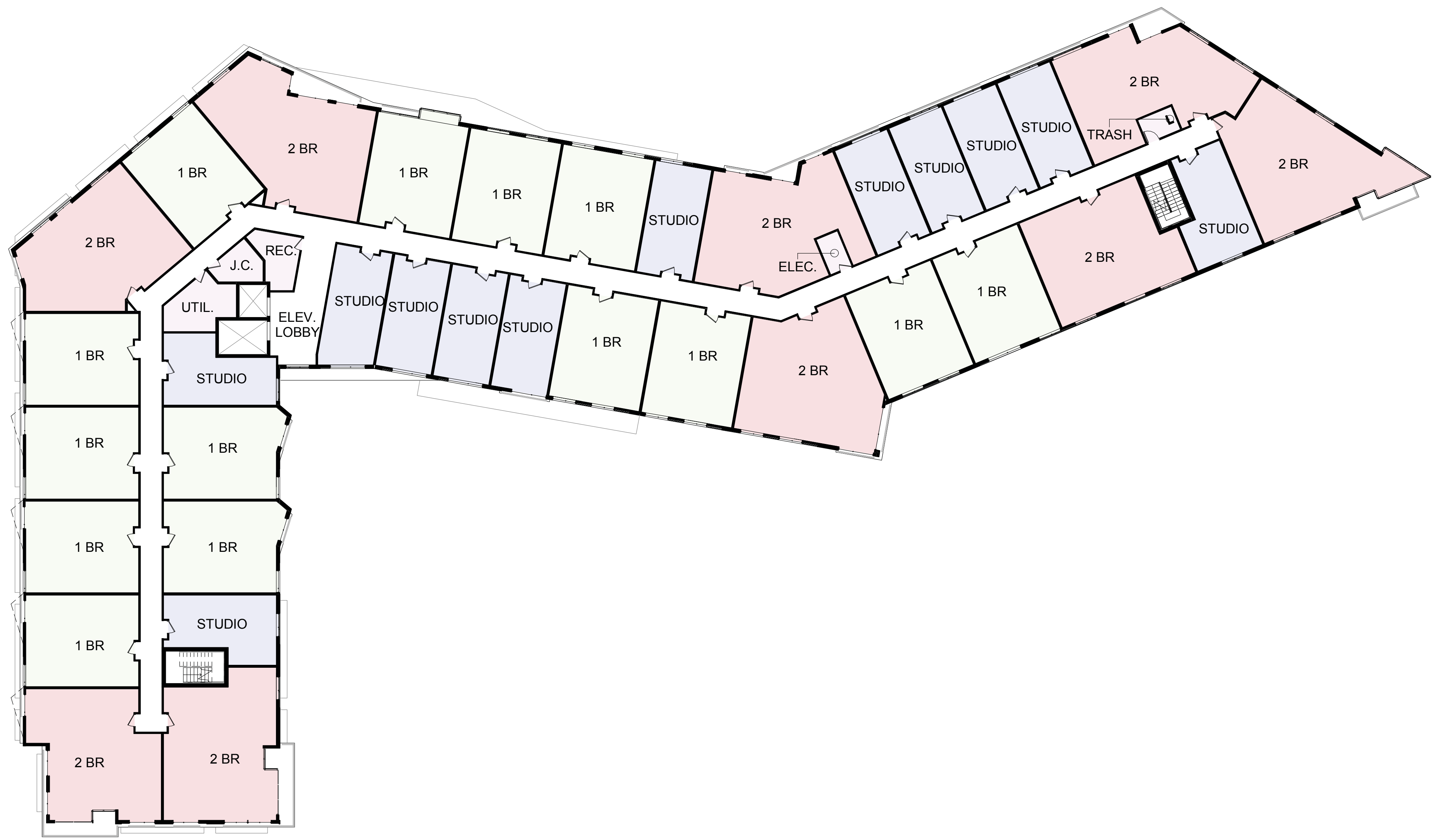
Figure 2-4
Existing Conditions Photographs
Source: Fort Point Associates, 2012

View of the Site looking Northwest

View of the Site looking Southeast

Figure 2-5
Existing Conditions Photographs
Source: Fort Point Associates, 2012

Figure 2-6
Ground Floor Plan
Source: DiMella Shaffer Architects, 2013



DiMella Shaffer
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Figure 2-7
Level 2 Floor Plan
Source: DiMella Shaffer Architects, 2013

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Figure 2-8
Typical Upper Level Floor Plan (Levels 3-5)
Source: DiMella Shaffer Architects, 2013

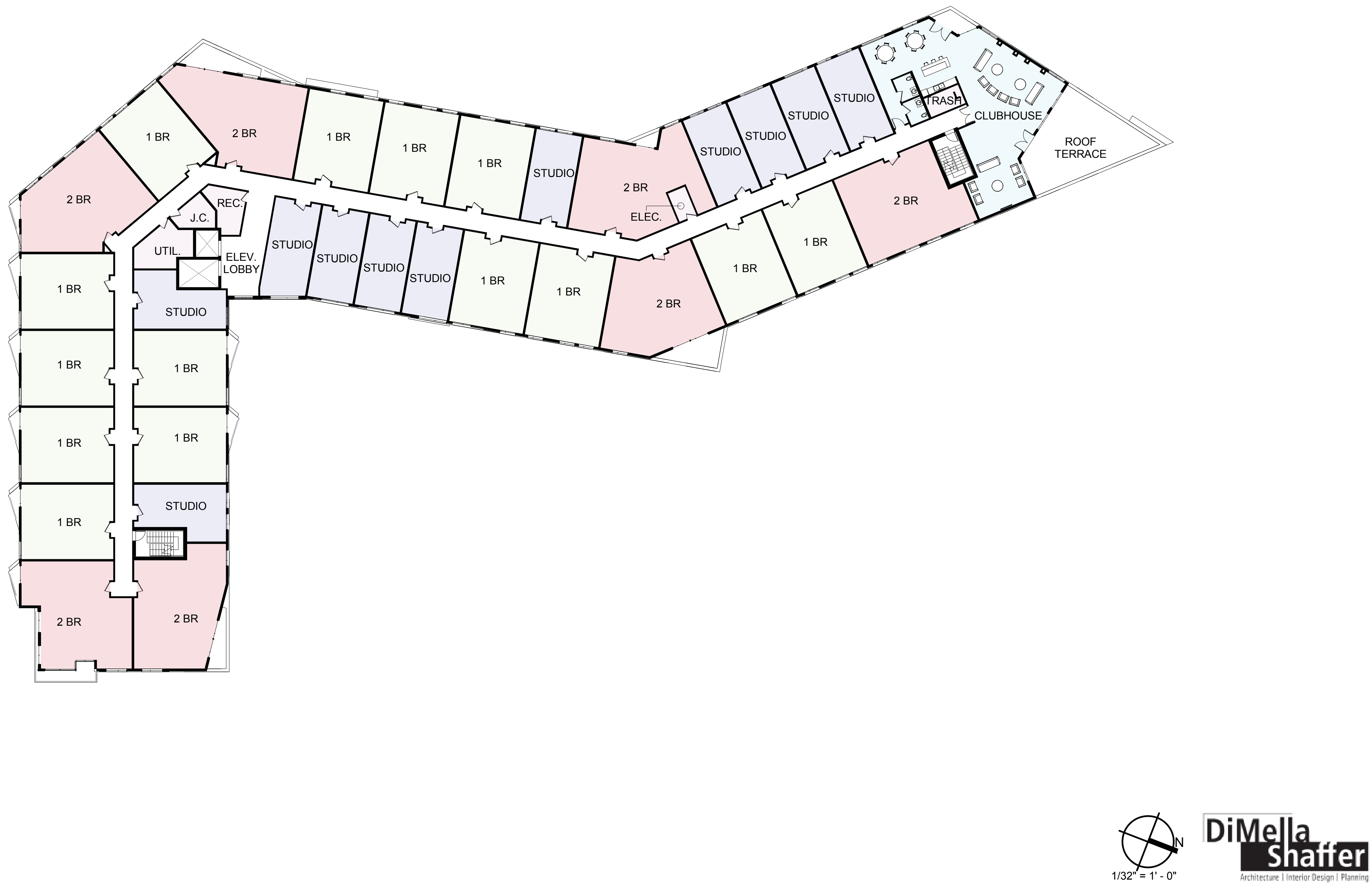


Figure 2-9
Level 6 Floor Plan
Source: DiMella Shaffer Architects, 2013

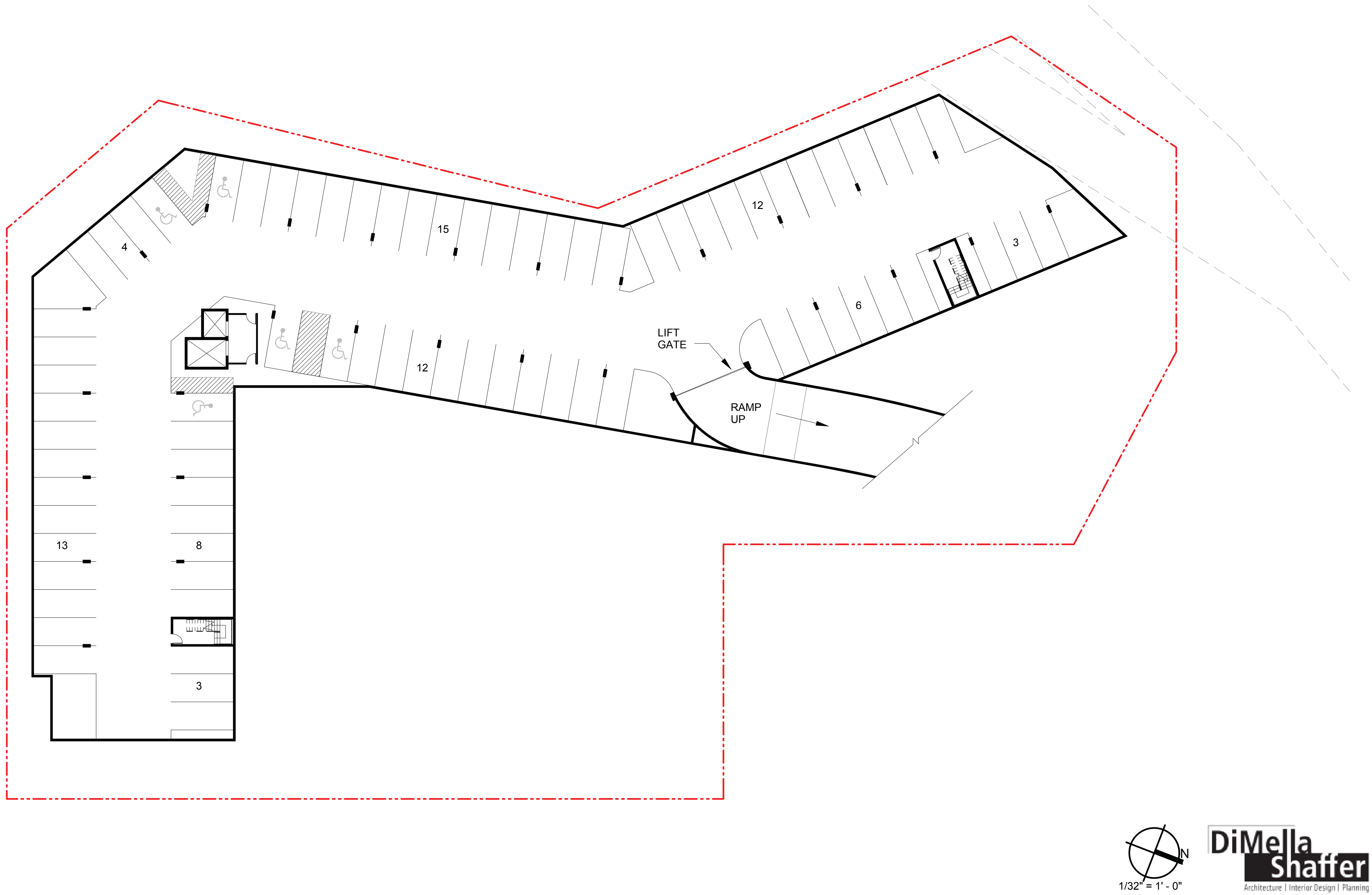


Figure 2-10
Parking Garage Plan
Source: DiMella Shaffer Architects, 2013

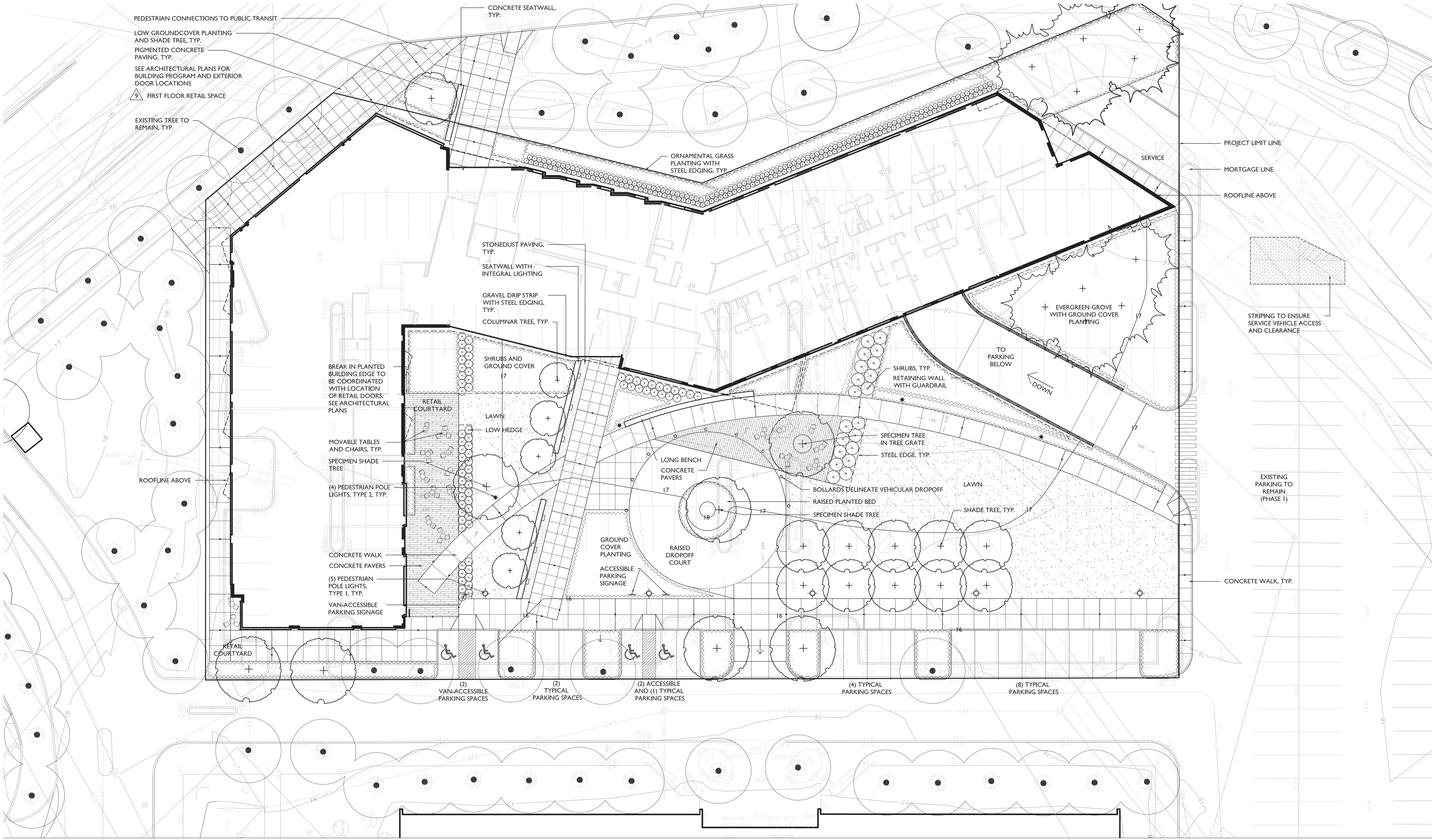


Figure 2-11
Landscape Plan
Source: Keith Wagner Partnership, 2013

Legend

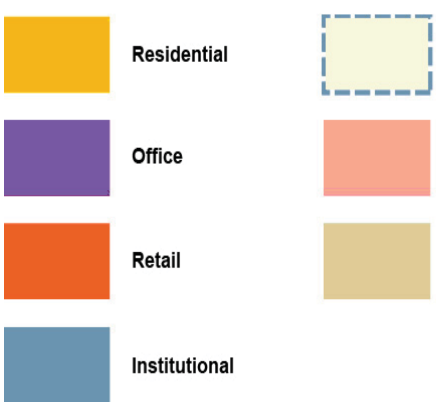
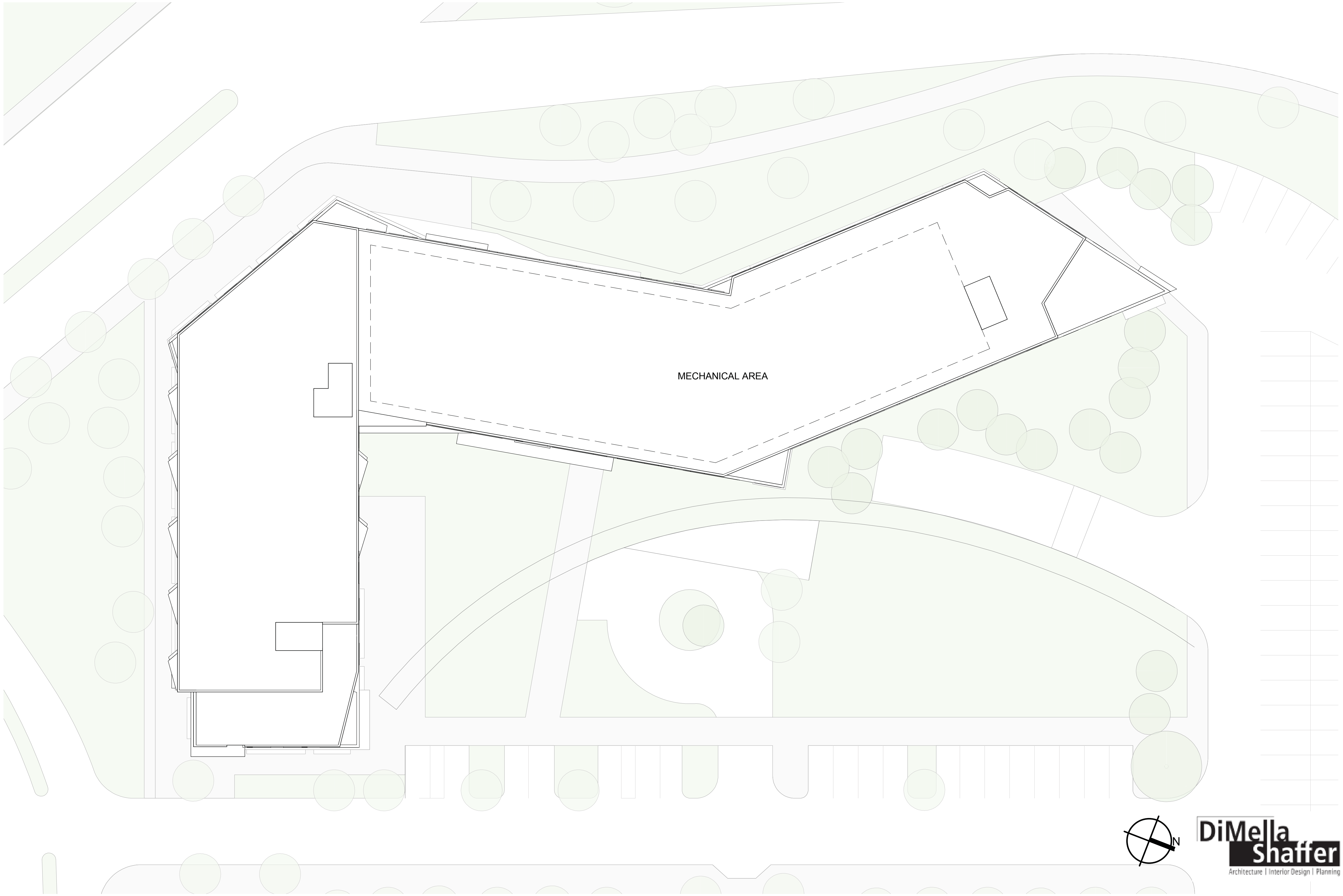


Figure 2-12
Columbia Point Master Plan Conceptual Land Use Plan
Source: Columbia Point Master Plan, 2011



University Place Residences
Dorchester, Massachusetts

Figure 2-13
Roof Plan
Source: DiMella Shaffer Architects, 2013

University Place Residences
Dorchester, Massachusetts

Figure 2-14
Chapter 91 Jurisdiction
Source: Fort Point Associates, 2007; MassDEP

Chapter 3

URBAN DESIGN

CHAPTER 3: URBAN DESIGN

3.1 INTRODUCTION

University Place Residences (the "Project") has been designed to improve the built character of Columbia Point and to foster a greater sense of place in the immediate area. The project is one of the first steps in the realization of the Columbia Point Master Plan. A key aspect of the Master Plan is to make public transit an attractive option to the greatest number of people. Aligned with this goal is the development of dense residential uses close to the JFK/UMass MBTA Station. University Place Residences is a response to that vision.

The Site is a 66,885 sf parcel bounded by Mount Vernon Street and the William J. Day Boulevard Connector to the west, William J. Day Boulevard to the north, an existing office building owned by an affiliate of the Proponent to the east (the "Existing Office Building"), and the former Bayside Expo and Conference Center ("Bayside Expo Center") owned by the University of Massachusetts Building Authority ("UMass") further to the east and to the south. The Site consists of contiguous parcels that will be re-subdivided into three new parcels. The new building will be located on a parcel that currently contains a surface parking lot (the "Project Parcel"). The parcel that will be created to the east of the Site (the "Office Building Parcel") is currently occupied by the existing 5-story Existing Office Building. The parcel that will be created to the north of the Site (the "Parking Parcel") contains a surface parking lot. See Figure 3-1, Project Site Plan.

Buildings in the immediate area are generally large and monolithic and surrounded by parking lots, providing little street-level activation. The poor condition of sidewalks in combination with the large surface parking lots between existing buildings make for an environment that is generally inhospitable to pedestrians. The Project will be an important first step to break down the existing "superblock" that is currently comprised of the Existing Office Building, the former Bayside Expo Center, and the Boston Teacher's Union Building, all of which are surrounded by a sea of surface parking. As the first building to be seen as one approaches Mount Vernon Street from the west, the Project will serve as a gateway to Columbia Point and a point of reference that will especially help to orient pedestrians traveling by MBTA to the area. See Figure 3-2, Neighborhood Context.

The Project will be built along the southern and western boundaries of the Site, providing street frontage that will be occupied by commercial uses to generate activity along Mount Vernon Street. A front lobby entrance for residents on axis with the JFK/UMass MBTA

Station, and a first floor façade that is designed with transparency to the interior gathering spaces, will further activate the public realm.

3.2 MASSING

The immediate area is characterized primarily by large buildings surrounded by surface parking lots, effectively making the streetscape uninviting to pedestrians. The Columbia Point Master Plan provides for new buildings that are a size and height appropriate to the scale of existing and proposed new streets within the area. The largest and tallest structures are proposed closest to the JFK/UMass MBTA Station along Morrissey Boulevard and at the west end of Mount Vernon Street. As part of this zone, the Site is an important edge to a major open space between it and Morrissey Boulevard that over time will become a more park-like setting as roadway, pedestrian, and bicycle path improvements in the Master Plan are implemented, as adjacent developments move forward, and as the space ultimately takes form as a gateway to the entire Columbia Point community.

While the Master Plan allows for taller massing on the Site than the proposed Project, an intermediate building height of 69 feet (approximately 75 feet to the mechanical enclosure) is most suitable to the current demand and economics of the marketplace. Thus, the Project approach is to use the building mass, at 6 stories and with an approximately 28,000 sf footprint, to mark the northeast edge of the gateway to Columbia Point and to frame the eastern edge of open space surrounding Morrissey Boulevard and Mount Vernon Street. This is achieved by bringing the building as close as possible to the Site's western boundary and creating a façade of sufficient length (approximately 360 feet) facing west to form a defined edge to the space. Similarly, bringing the building mass up to and along Mount Vernon Street begins to create a street wall that ultimately will extend through future development to Harbor Point. Finally, by aligning with and extending along the former Bayside Expo Center site, the building initiates a new street edge that has been visualized in the Master Plan and ultimately extends into the former Bayside Expo Center site and on to the waterfront. To give importance to Mount Vernon Street, the south wing of the massing is raised (also concealing a portion of the building mechanical equipment), marking the entry to the building and the presence of ground floor commercial at this end of the building. Along with commercial spaces, amenity areas for residents, including exercise, fitness, and conference space, will be visible along Mount Vernon Street. See Figures 3-3 to 3-8, Perspectives.

Placing the building mass at the edge of the parcel also results in creation of new green space within the Site. This space replaces much of the existing parking lot and will be enjoyed by building residents and users of the University Place Office Center. The new commercial space and lobby will have entrances leading to and from the new green space, providing opportunities for activation. Most of the remainder of the ground level on the north end of the building contains residential units facing green space on both sides of the Site.

The Parking Parcel to the north presents an opportunity for future development when economic conditions allow. This would frame the north edge of the green space and complete a pedestrian link of the Site (through the DCR land to the north) to William J. Day Boulevard, Joe Moakley Park, and Carson Beach.

On floors 2-6, the building mass is organized with residential units facing both the street and the new green space that will be created behind the new building.

3.3 OPEN SPACE

The massing and placement of the new building provides edges and gives form to both large and small open spaces. As noted above, the eastern edge of the gateway space to the community is formed by the project. Internal to the Site, a large green space is created, which is framed by the new building, the Existing Office Building, and ultimately the expanded future development to the north. Sidewalks connect these spaces to each other and to secondary smaller spaces, or pocket parks, that are also given shape by the building. A triangular green space becomes part of the entry experience to the former Bayside Expo Center parcel. A small green space at the south end of the office building is better defined as a "pocket park" by the presence of the new building at one of its edges. This series of open spaces creates a foundation for linked green spaces that should ultimately lead to the waterfront.

3.4 VIEWS

The Site is pivotal in both reinforcing existing view corridors and establishing future sight lines to the waterfront. By hugging the Mount Vernon Street property line, the new building will reinforce a sight line down Mount Vernon Street toward Columbia Point and the existing UMass Boston campus. By turning the mass of the building to align with future Central Commercial Street as envisioned by the Columbia Point Master Plan, a sight line is established that ultimately will lead to the waterfront.

3.5 VEHICLE CIRCULATION AND PEDESTRIAN ENVIRONMENT

Mount Vernon Street is a major vehicular road that connects Columbia Point to other regional roadways, including William J. Day Boulevard and Old Colony Avenue to the north, William T. Morrissey Boulevard to the south, and Columbia Road to the west. It also provides access to southeast expressway I-93 north and south as well as access to pick-up and drop-off areas for the JFK/UMass MBTA Station. Mount Vernon Street will continue to serve as a major vehicular way.

The Columbia Point Master Plan indicates that the current intersection of Morrissey Boulevard and Mount Vernon Street and the various branch roads around the intersection are at angled geometries creating a confusing vehicular and pedestrian environment. It is difficult to understand the direction to various landmarks in the area. The configuration of the Project mass establishes important new street edges at the entry to Columbia Point. As such, it helps to organize both vehicular and pedestrian movement in an understandable way by reinforcing street direction and beginning to establish a pedestrian-friendly, tree-lined streetscape.

The Mount Vernon Street axis is strengthened by the building mass, regular row of street trees, and sidewalk. The building turns off of Mount Vernon Street to align with the Mount Vernon Street Entrance. Currently serving the existing parking lot on the Site, the Existing Office Building, and adjacent hotel, the Mount Vernon Street Entrance will also serve the Project. The Columbia Point Master Plan recognizes this roadway as an important access to the future development on the former Bayside Expo Center parcel, labeling it a future Central Commercial Street. The Mount Vernon Street Entrance will be improved with sidewalks, lighting, trees and other landscaping to give it a more street-like character in anticipation of this transformation. The pedestrian realm will be activated by visible commercial space and residential gathering spaces located on the ground floor of the building. While access to Boston Harbor from the Site is possible currently, it is anticipated that the future build-out of the former Bayside Expo Center site will provide an opportunity to begin to realize the Central Commercial Street, which will adhere to Boston's draft Complete Streets Guidelines. See Figure 3-1, Project Site Plan.

3.6 LANDSCAPE

A new, landscaped green space will be created on the east side of the building between the University Place Residences and the University Place Office Center. Parking spaces are laid out to retain the maximum number of mature existing trees. An outdoor commercial courtyard adjacent to the commercial space provides informal gathering and outdoor seating spaces, just a short walk from the JFK/UMass MBTA Station. To the north of the commercial courtyard, a line of columnar trees and a continuous seatwall separate the commercial and residential areas. A curved walk bisects the continuous seatwall. This walk connects the commercial courtyard to the residential units, dropoff court, subsurface parking vehicular access, existing parking lots to the north and potential future development. The raised dropoff court and adjacent accessible parking spaces provide access for all future users, and are delineated by bollards to create flexible, shaded space near the residential entrance. A continuous bench near the main entry, special paving, and a large specimen tree provide flexible outdoor space for residents. See Figure 3-9, Landscape Plan.

The proposed landscape plan removes 25 existing trees, and replaces them with 28 new trees, including three large specimen trees, in addition to masses of large shrubs and groundcover plantings. The proposed plan removes 231 surface parking spaces from the site (226 standard spaces, 5 accessible spaces), which are replaced by 83 total spaces, including 76 covered parking spaces and 7 surface spaces (including 2 accessible spaces and 2 van accessible spaces).

Existing light poles in the surface parking lot will be removed and replaced with pedestrian pole lights along the easternmost walkway paralleling the site access drive. Pedestrian pole lights will also be provided along the curving walkway and integrated wall lights will be installed along the continuous seatwall leading to the main residential entrance.

3.7 CHARACTER AND MATERIALS

The new building character and materials will reflect the Site conditions and the building's mixed-use program. Building elements will contain a combination of vertically and horizontally oriented materials, serving to break down the massing of the primary facades. Full height glass on residential floors will be used in key portions of the building to maximize incoming light and views from residential units toward downtown Boston and the waterfront. Architectural details such as bay windows and light shelves will be used to articulate facades and maximize daylight in the interior spaces. Entry canopies on the east and west facades will mark building entrances and provide protection from the elements for pedestrian visitors.

The façades overlooking Mount Vernon Street and the Mount Vernon Street Entrance will address the immediate pedestrian and commercial urban context. On the first floor, commercial frontage comprised of large, glass panels will help to activate the pedestrian realm at the street level. Above bay windows, balconies and large glass openings will overlook the streets below, the small open space to the south of the Existing Office Building, and the water views beyond the former Bayside Expo Center. This taller portion of the building, hiding roof mechanical equipment, will be clad with a mix of vertically corrugated metal panels and horizontal metal panels. The east façade will be predominantly clad in horizontal metal panels accentuating its linearity. The mass will be broken by punched openings composed of windows and metal shingle inserts. The top floor will be rendered as an unfolding ribbon of metal and glass to create larger terraces. The northern end of the building will present oversized glass surfaces to take advantage of the views towards downtown Boston, Joe Moakley Park, and Carson Beach. The façades facing the courtyard will also be clad in horizontal metal panels and metal shingles. The building volume will be articulated with balconies and French doors located at corners facing water views. See Figure 3-10, Elevations.

3.8 SUSTAINABILITY

3.8.1 ARTICLE 37

To comply with Article 37, the proponent intends to measure the results of their sustainability initiatives using the framework of the Leadership in Energy and Environmental Design (LEED) rating system. As a new construction residential apartment building, the University Place Residences project is categorized as a LEED BD&C – NC 2009 (New Construction) project. The LEED rating system tracks the sustainable features of the project by achieving points in following categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation in Design and Regional Priorities.

The project team will demonstrate certifiable status at a minimum under the LEED rating system through the submission of a LEED scorecard that will include an explanation of the project's approach to achieving each of the identified LEED points. The scorecard will be updated regularly as the design develops and engineering assumptions are substantiated. See Figure 3-11, LEED Scorecard.

3.8.2 SUSTAINABLE SITES

This category seeks to encourage development on sites that minimize the impact of construction on the natural environment. Strategies include: locating new construction on sites that are not environmentally sensitive, development on sites that are positioned to take advantage of existing infrastructure, site selection that is in close proximity to mass transportation and that encourages alternative modes of transit, and site development that requires remediation of environmental contaminants.

The Site is located in an urban environment that is beneficial in obtaining the aforementioned credits. The Site is well served by existing utility infrastructure. The project's siting serves to discourage building users' reliance on automobiles through its proximity to public transportation, reduction in the total number of parking spaces on the Site, and planned bike storage within the building. Three percent of the total vehicle parking capacity on site will be provided with electrical vehicle recharging stations. In addition, the Proponent will undertake soil remediation due to found environmental contaminants, which will improve the overall environmental condition of the Site.

3.8.3 WATER EFFICIENCY

To address the requirements of the Water Use Reduction Prerequisite and Credits, the project will incorporate water conservation strategies to reduce potable water use for building sewage conveyance, including low flow plumbing fixtures for water closets and faucets. In addition, landscape plantings will include large grouped sections of drought tolerant plant species within the landscaped area to significantly reduce the amount of irrigation by 50% from a calculated midsummer baseline and satisfy the requirement for the points under the Water Efficient Landscaping credit. The water conservation measures will increase the water efficiency within the building and reduce the burden on municipal water supply and wastewater systems.

3.8.4 ENERGY AND ATMOSPHERE

The building is designed to optimize energy efficiency and will comply with the Stretch Energy Code whereby energy use is reduced from the baseline energy conservation code by 20%. To fulfill this requirement, high efficiency heating and cooling systems will be utilized throughout the project. This will also result in securing several Optimize Energy Performance (EA Credit 1) credits. In addition, Fundamental and Enhanced Commissioning of the building energy systems will be performed in compliance with LEED prerequisites and credits to ensure that systems are operating at peak efficiency. A Measurement and Verification (M&V) plan will also be implemented that extends the ongoing accountability of the performance building energy systems over time. Further, no chlorofluorocarbons (CFC) based refrigerants will be used in the project to reduce ozone depletion in the atmosphere, as well as satisfying the Fundamental Refrigeration Management prerequisite. Enhanced Refrigeration Management measures will also be undertaken to further reduce emissions from the building that contribute to climate change.

3.8.5 MATERIALS AND RESOURCES

The materials that are used in the construction of buildings have a profound impact on the amount of virgin materials that are harvested and also the amount of waste products that are generated. Recycling diverts material waste products from landfills and reduces the demand for virgin materials. In addition, the extraction, processing, and transportation of materials to project sites consumes energy and contributes to carbon dioxide emissions. The use of locally extracted and processed materials stimulates the local economy.

A demolition and construction waste management plan will be implemented to divert at least 75% of the construction waste material from landfills per the Construction Waste Management credit. The Project includes recycling facilities within the building in accordance with the requirements of the Storage & Collection of Recyclables prerequisite. Building materials will be specified to take into account their recycled content such that points will be achieved under the Recycled Content credit. To encourage environmentally responsible forest management, credit under Certified Wood (MR Credit 7) will be pursued.

3.8.6 INDOOR ENVIRONMENTAL QUALITY

Safeguarding the comfort and well-being of the occupants is a fundamental obligation. The quality of indoor air, and specifically the reduction of airborne pollutants, is known to minimize occurrences of asthma, allergies, and other health ailments. Irritating off gassing, caused by the presence of volatile organic compounds (VOCs) in interior finishes, can be avoided by using products that release fewer and less harmful chemical compounds. To reduce the presence of VOCs, low-emitting adhesives and sealants, paints, and carpet systems will be specified throughout the project.

In addition to the quality of indoor air, access to daylight and views is central in achieving occupant comfort and will be provided through generous expanses of vision glass. Occupants will also have control over lighting and their thermal environment. During construction, an indoor air quality management plan will be implemented to prevent contamination of mechanical systems and absorptive materials.

3.8.7 INNOVATION IN DESIGN

The Project anticipates that one point will be achieved in the Innovation In Design category. It is expected for exemplary performance on the Heat Island Effect – Nonroof (SS Credit 7.1) by utilizing 100% of nonroof impervious surfaces with high-albedo or open-grid paving or will be shaded within 5 years.

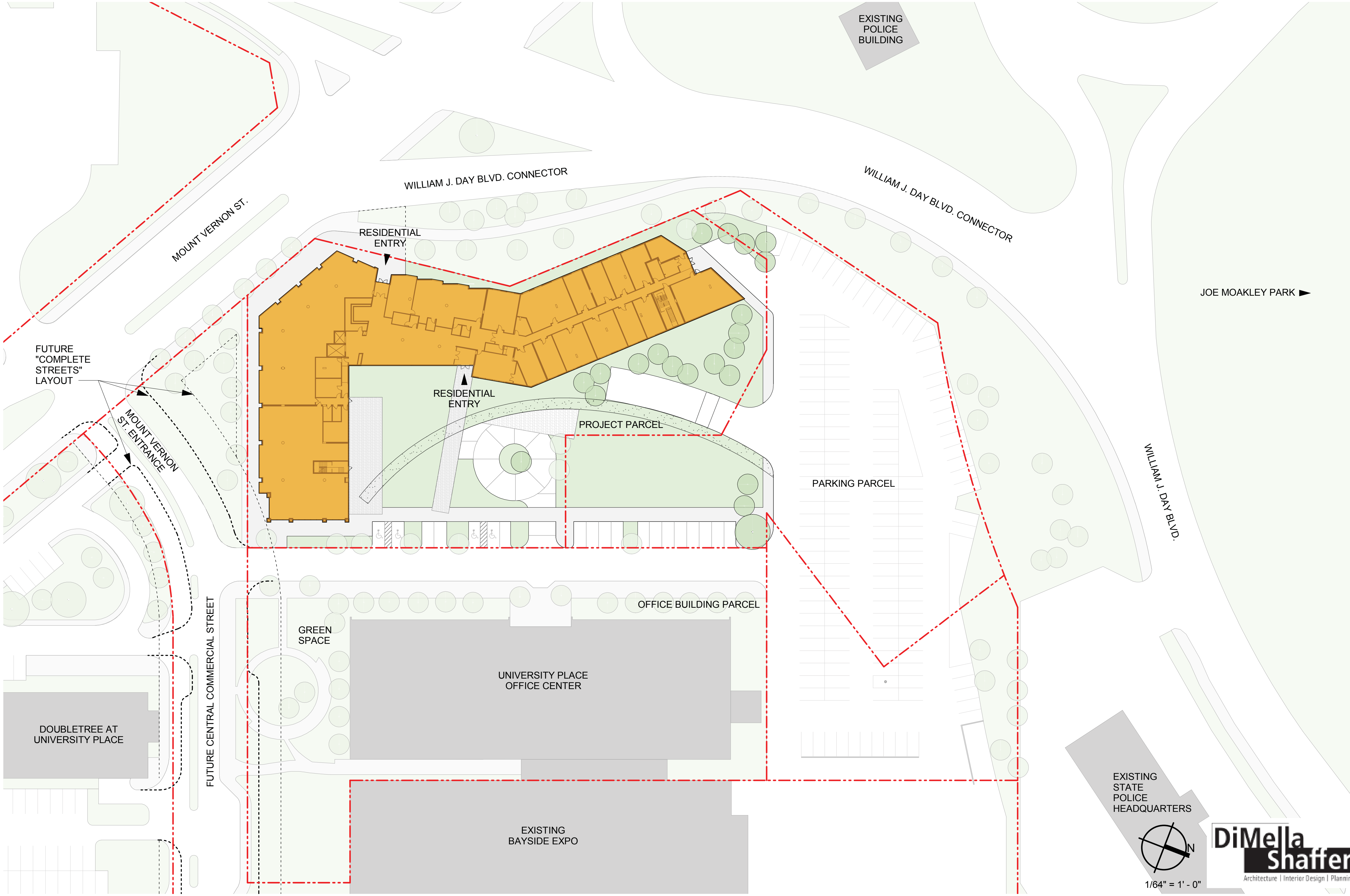


Figure 3-1
Project Site Plan
Source: DiMella Shaffer Architects, 2013

University Place Residences
Dorchester, Massachusetts

Figure 3-2
Neighborhood Context
Source: Boston Redevelopment Authority, 2006

University Place Residences
Dorchester, Massachusetts

Figure 3-3
Perspective from Mount Vernon Street
Source: DiMella Shaffer Architects, 2013

University Place Residences
Dorchester, Massachusetts

Figure 3-4
Perspective from Mount Vernon Street Entrance
Source: DiMella Shaffer Architects, 2013

University Place Residences
Dorchester, Massachusetts

Figure 3-5
Perspective from the South
Source: DiMella Shaffer Architects, 2013

University Place Residences
Dorchester, Massachusetts

Figure 3-6
Perspective of Main Pedestrian Entrance
Source: DiMella Shaffer Architects, 2013

University Place Residences
Dorchester, Massachusetts

Figure 3-7
Perspective of Ground Floor Commercial Space
Source: DiMella Shaffer Architects, 2013

University Place Residences
Dorchester, Massachusetts

Figure 3-8
Perspective from the Courtyard
Source: DiMella Shaffer Architects, 2013

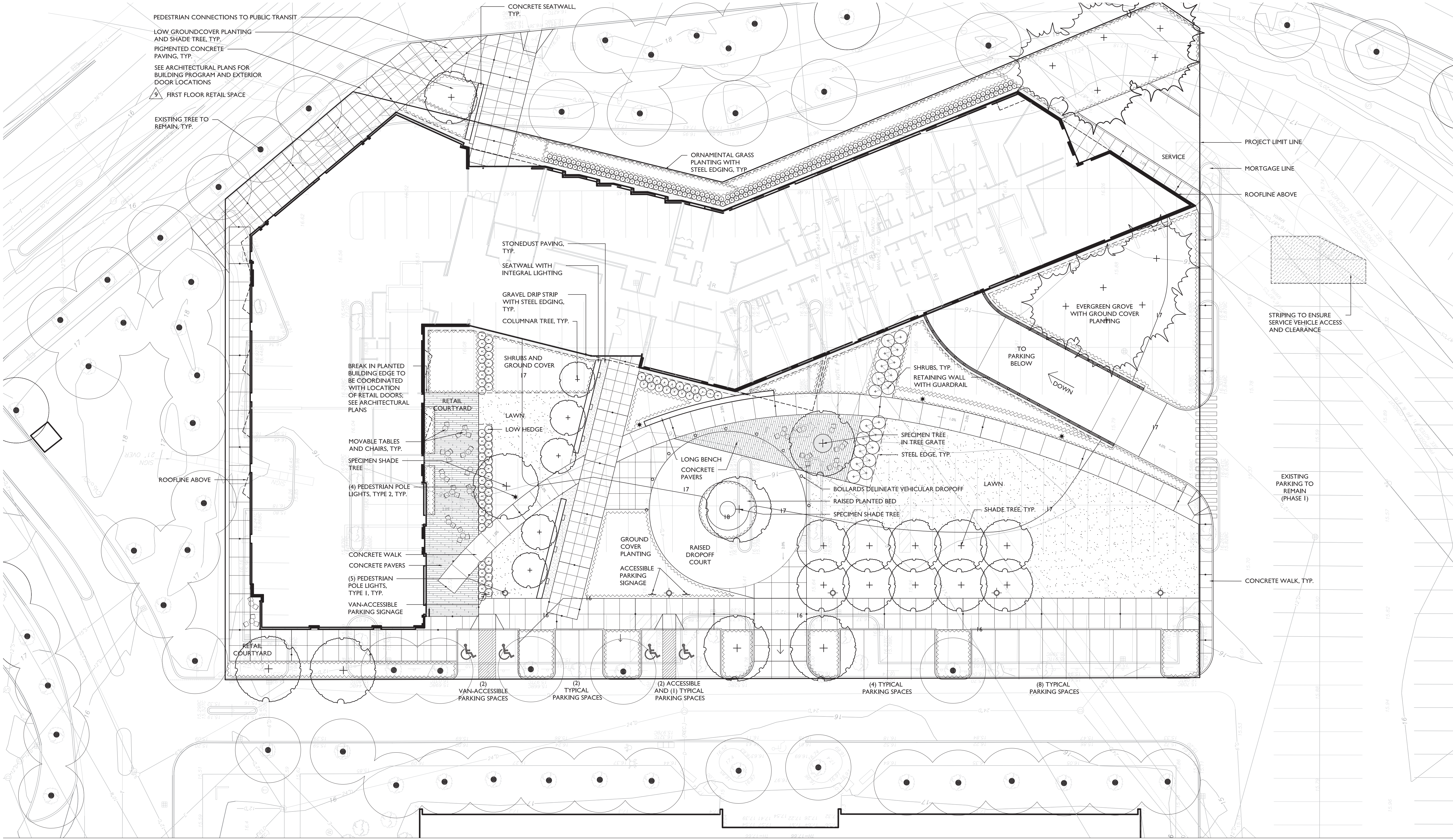
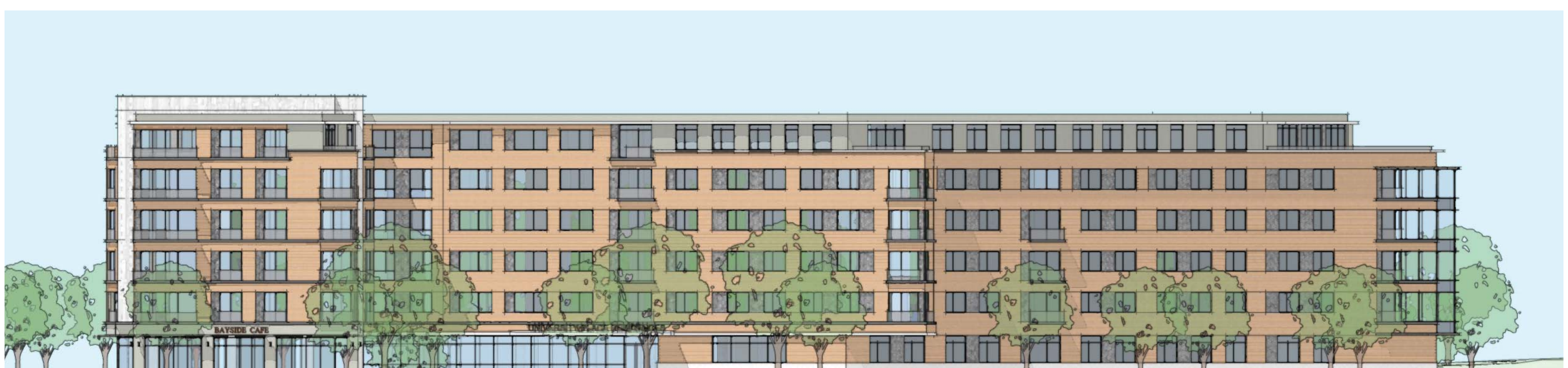


Figure 3-9
Landscape Plan
Source: Keith Wagner Partnership, 2013

NORTH ELEVATION

SOUTH ELEVATION

WEST ELEVATION



EAST ELEVATION

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Figure 3-10
Elevations
Source: DiMella Shaffer Architects, 2013

LEED 2009 for New Construction and Major Renovations

Project Checklist

Y	?	N	Sustainable Sites		Possible Points: 26
23	2	1			
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

Y	?	N	Water Efficiency		Possible Points: 10
4	1	5			
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
2	1	1	Credit 3	Water Use Reduction	2 to 4

Y	?	N	Energy and Atmosphere		Possible Points: 35
4	11	20			
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
4	2	13	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

Y	?	N	Materials and Resources		Possible Points: 14
4	2	8			
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

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

Y	?	N	Indoor Environmental Quality		Possible Points: 15
11	2	2			
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

Y	?	N	Innovation and Design Process		Possible Points: 6
1	1				
	1		Credit 1.1	Innovation in Design: Exemplary Performance SS Credit 7.1 / Heat Isl	1
			Credit 1.2	Innovation in Design: Specific Title	1
			Credit 1.3	Innovation in Design: Specific Title	1
			Credit 1.4	Innovation in Design: Specific Title	1
			Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1

Y	?	N	Regional Priority Credits		Possible Points: 4
		2			
		1	Credit 1.1	Regional Priority: Meet or Exceed EAcr2	1
		1	Credit 1.2	Regional Priority: Meet or Exceed MRcr1.1	1
			Credit 1.3	Regional Priority: Specific Credit	1
			Credit 1.4	Regional Priority: Specific Credit	1

Y	?	N	Total		Possible Points: 110
47	19	38			

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

Chapter 4

TRANSPORTATION

CHAPTER 4: TRANSPORTATION

4.1 INTRODUCTION

University Place Residences LLC (the "Proponent") has proposed the University Place Residences (the "Project") on a 66,885 sf parking lot on Mount Vernon Street ein Dorchester (the "Site"). The Project includes 184 apartment units and approximately 10,000 sf of pedestrian oriented, neighborhood commercial space. Of the 184 apartments, 24 will be designated affordable. The Project also includes a mix of underground parking, surface parking, and new green space. The design of the new building has been extensively discussed with the Boston Redevelopment Authority (BRA) to ensure that it provides a unique, urban anchor to the area around the JFK/UMass Station, and to comply with the City of Boston's Complete Streets Guidelines and environmental goals. Adjacent to the Site is an existing 5-story office building that houses the corporate offices of Corcoran Jennison, the Service Employees International Union ("SEIU"), and an office of the Massachusetts Registry of Vital Records. The Site's location is shown in Figure 4-1, Locus Map.

The Project will contribute to the continued revitalization of Columbia Point by creating new residential and commercial space situated to take advantage of the Site's excellent transit, cycling, and roadway connections to downtown Boston and other destinations around the city. The Project's mix of uses will also generate new pedestrian traffic that aligns with the City's goal of redesigning the area, particularly Mount Vernon Street, in line with its Complete Streets Guidelines.

The Site is located less than one quarter mile from the JFK/UMass MBTA Station on the Red Line. Both branches of the Red Line, the Commuter Rail, and several MBTA bus lines serve this station so it is anticipated that many of the residents and any commercial patrons the Project may attract will make their way to and from the Site via public transit.

For this reason, the Project is expected to generate a relatively modest volume of new vehicle trips on adjacent roadways. In addition, the Proponent will implement transportation demand management (TDM) measures to further decrease automobile reliance by residents and visitors. Covered bicycle parking, electrical vehicle charging facilities, and zip car parking, will be made available to residents. The proposed commercial space is expected to serve local residents and is not considered "destination" commercial space that would attract more visitors to the area and generate an increase in traffic.

The transportation component of this Expanded Project Notification Form (EPNF) describes the existing transportation conditions near the Site, evaluates the anticipated transportation impacts of the Project, and discusses measures to reduce and/or mitigate those impacts. The Proponent has already worked with the BRA and Boston Transportation Department (BTD) in planning for the Project to date and looks forward to continuing that partnership to assure that the Project is successful from a transportation standpoint.

4.2 EXISTING (2012) TRANSPORTATION CONDITIONS

The Site is located on the Columbia Point peninsula near the shoreline of Dorchester Bay. It is relatively flat and consists of a surface parking lot. The Site is bounded by Mount Vernon Street and the William J. Day Boulevard connector to the west, William J. Day Boulevard to the north, an existing office building owned by an affiliate of the Proponent to the east (the "Office Building"), and the former Bayside Expo and Conference Center ("Bayside Expo Center") owned by the University of Massachusetts Building Authority ("UMass") further to the east and to the south. Less than one quarter mile to the west is the JFK/UMass station which is served by the MBTA Red Line, Commuter Rail, and several bus routes. The nearest retail and commercial activity is located at a Shaw's grocery store to the west of the Site, just south of the JFK/UMass Station. The Site has access to the regional highway system at the I-93/Columbia Road interchange.

4.2.1 ROADWAY NETWORK AND VEHICULAR CONNECTIONS

The Project is located at the northwest edge of the Columbia Point peninsula between Mount Vernon Street, Morrissey Boulevard, and William J. Day Boulevard. Mount Vernon Street provides access into the existing UMass Boston campus and the Harbor Point Apartments; it carries relatively low traffic volumes, as it does not provide regional connectivity. Morrissey Boulevard and William J. Day Boulevard do provide regional connections and see a correspondingly heavier volume of through traffic.

The Site has street frontage on Mount Vernon Street, which carries two-way traffic between Morrissey Boulevard in the west to University Drive North in the east. Mount Vernon Street, which is the only road owned by the City of Boston on the Columbia Point peninsula, provides access to UMass Boston's existing campus, the Harbor Point Apartments, the Peninsula Apartments, and the former Bayside Expo Center. On its western end, Mount Vernon Street provides access to Morrissey Boulevard and William J. Day Boulevard.

The transportation study area for the Project includes the roadways that will provide the principal entrance and exit for the Site. In existing conditions, primary access to the Site is via an existing roadway on UMass property to which the Proponent holds an easement that extends north from Mount Vernon Street, which is the anticipated Central Commercial Street identified in the Columbia Point Master Plan (the "Mount Vernon Street Entrance"). Access will be similar under the proposed conditions although it is anticipated that the nature of the Mount Vernon Street Entrance may change in the future to become more aligned with the vision of the Columbia Point Master Plan and the City of Boston's Complete Streets Guidelines as the area around the Site continues to be redeveloped. The Project's transportation study area includes the following intersections, as shown in Figure 4-2, Study Area Intersections:

- Mount Vernon Street Entrance/Mount Vernon Street
- Mount Vernon Street/Morrissey Boulevard
- Mount Vernon Street/William J. Day Boulevard

4.2.2 STUDY AREA INTERSECTIONS

Mount Vernon Street/Mount Vernon Street Entrance/Sovereign Bank Parking Lot Driveway is an unsignalized intersection with four approaches. The eastbound approach of Mount Vernon Street consists of a 10-foot exclusive left-turn lane, a 10-foot through lane, and a 10-foot through/right-turn lane. The exclusive left-turn lane is approximately 85 feet long. Westbound, Mount Vernon Street consists of a 10-foot left-turn/through lane and a 10-foot through/right-turn lane. The eastbound and westbound lanes of Mount Vernon Street are separated by a grass and concrete median, which varies between 5 and 8 feet wide. The southbound approach, the Mount Vernon Street Entrance, consists of a shared, 15-foot left-turn/through/right-turn lane. The entering and exiting lanes of the Mount Vernon Street Entrance are separated by a 4-foot grass median. The northbound approach, the driveway to Sovereign Bank is 22 feet wide and provides both an entrance and exit to the bank property, which includes a 637 space employee parking lot and a 41 space customer lot.

The Mount Vernon Street approaches are provided with 8-foot sidewalks. A 3-foot sidewalk is present on the east side of the Mount Vernon Street Entrance approach. A crosswalk is provided at the westbound Mount Vernon Street approach and the eastbound receiving lanes. A handicapped ramp is provided on the north and south ends of this crosswalk; however, it has no ramps crossing through the median and is not ADA-compliant. MBTA bus stops occupy the curbs just to the west and east of the intersection. Pavement and pavement markings were in good to fair condition at the time of observation.

Mount Vernon Street and William J. Day Boulevard is a stop controlled intersection with three approaches. The William J. Day Boulevard eastbound approach consists of a 14-foot through lane and a 14-foot through/right-turn lane. Westbound, William J. Day Boulevard consists of a 9-foot left-turn/through lane and a 13-foot through lane. West of the intersection, the eastbound and westbound lanes of William J. Day Boulevard are separated by a 4-foot concrete median. Mount Vernon Street northbound consists of two, 11-foot right-turn lanes. Left turns are not permitted from this approach. The northbound and southbound lanes of Mount Vernon Street are separated by a 3-foot concrete median.

Signals are present at Mount Vernon Street/William J. Day Boulevard; however, throughout the day they blink yellow for the William J. Day Boulevard approaches and red for the Mount Vernon Street approach, which is also controlled by a stop sign. Pedestrian signals with actuator buttons are also present at the intersection but were found to be inoperative at the time of observation.

All approaches to the intersection are provided with sidewalks that vary between 8 and 11 feet in width. Crosswalks with handicapped ramps are provided across the Mount Vernon Street approach and the William J. Day Boulevard eastbound approach. Pavement and pavement markings were in good condition at the time of observation.

Mount Vernon Street and Morrissey Boulevard is a signalized intersection with four approaches. Eastbound Mount Vernon Street consists of a shared, 18-foot left-turn/through lane. While striped as a single lane, field observations showed that motorists sometimes treat this approach as having two lanes. Westbound Mount Vernon Street consists of an 11-foot through lane, a 12-foot through lane, and 21-foot channelized right-turn lane. The exclusive right-turn lane is yield-controlled. The eastbound and westbound lanes of Mount Vernon Street on both sides of the intersection are separated by a concrete median which varies between 3 and 8 feet in width.

Northbound Morrissey Boulevard consists of two, 12-foot left turn lanes, a 14-foot through lane, a 13-foot through lane, and a channelized, exclusive right-turn lane. This right-turn lane operates as a free movement. A 14-foot, concrete median separates the two left-turn lanes of this approach from the through and right-turn lanes. Southbound, Morrissey Boulevard consists of two, 12-foot left-turn lanes and a channelized right-turn lane that is 27 feet wide. While striped as a single lane, during observations this approach sometimes operated as two lanes. This approach is signal controlled.

Sidewalks, crosswalks with handicapped ramps, and pedestrian signals are provided on all approaches to this intersection with the exception of the westbound and northbound slip lanes. These approaches are provided with handicapped ramps and crosswalks, but no pedestrian signals.

4.2.3 DATA COLLECTION

To establish baseline conditions, vehicular, pedestrian and bicycle counts were performed at the three study area intersections during the AM (7:00 to 9:00) and PM peak (4:00 to 6:00) periods. Counts were performed on Thursday September 9, 2012 to ensure that all schools would be in session and the majority of workers back from summer vacations. The traffic counts determined that the peak hours in the study area are from 7:45 to 8:45 AM and from 4:00 to 5:00 PM

4.2.4 EXISTING (2012) INTERSECTION OPERATIONS

Operations Analysis Methodology

This EPNF includes a transportation section that thoroughly assesses the transportation impacts associated with the proposed project in accordance with accepted engineering standards and with the requirements issued by the BRA and BTD.

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay incurred by vehicles at intersections and along intersection approaches. Existing vehicular traffic conditions were analyzed using Trafficware's Synchro software. This software is based on the traffic operational analysis methodology of the Transportation Research Board's *2000 Highway Capacity Manual (HCM)*. A field inventory of lane geometry, existing questions, traffic signal timings, and 2012 traffic volumes were used to create the Synchro network. In terms of the measures of effectiveness, LOS A defines the most favorable condition, with minimum traffic delay. LOS F represents the worst condition, with significant traffic delay. Table 4-1, Intersection Level of Service Criteria, summarizes the delay and LOS thresholds for signalized and unsignalized intersections, as defined in the HCM.

Table 4-1: Intersection Level of Service Criteria

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

The threshold at LOS E/LOS F indicates that the intersection, or intersection approach, is theoretically at capacity. LOS D is generally considered acceptable in an urban environment, such as the Project transportation study area, and below theoretical operating capacity.

Capacity analysis is presented in Table 4-2, Existing Conditions (2012) AM Peak Hour, and Table 4-3, Existing Conditions (2012) PM Peak Hour. Volumes are shown in Figure 4-3, 2012 Existing Conditions AM Peak Hour, and Figure 4-4, 2012 Existing Conditions PM Peak Hour.

Table 4-2: Existing Conditions (2012) AM Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percentile Queue Length (feet)
Signalized Intersections				
Mount Vernon Street/Morrissey Blvd.	**F**	>80.0	-	-
Mount Vernon EB left/thru | thru	B	16.5	0.08	23
Mount Vernon WB thru | thru	B	18.5	0.30	78
Mount Vernon WB right	A	4.9	0.10	17
Morrissey NB left | left	F	>80.0	>1.0	#436
Morrissey NB thru | thru	F	>80.0	>1.0	#412
Morrissey NB right	B	18.5	0.34	72
Morrissey SB left | left	C	27.0	0.42	115
Morrissey SB right	B	15.4	0.56	72
Unsignalized Intersections				
William J. Day Boulevard/Mount Vernon Street	-	-	-	-
William J. Day EB thru | thru/right	A	0.0	0.31	0
William J. Day WEB left/thru | thru	A	9.8	0.13	40
Mount Vernon NB right	F	>80.0	>1.0	510
Mount Vernon Street/Mount Vernon Street Entrance	-	-	-	-
Mount Vernon EB left	A	8.0	0.06	5
Mount Vernon EB thru | thru/right	A	0.0	0.18	0
Mount Vernon WB left/thru | thru/right	A	0.5	0.10	1
Sovereign Bank Drive NB left/thru/right	C	21.6	0.24	23
Mount Vernon Street Entrance SB left/thru/right	B	13.7	0.18	16

= 95th percentile volume exceeds capacity; queue may be longer. Queue shown is after 2 cycles. m = volume for 95th percentile queue is metered by upstream signal.

Table 4-3: Existing Conditions (2012) PM Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percentile Queue Length (feet)
Signalized Intersections				
Mount Vernon Street/Morrissey Blvd.	**C**	**24.7**	-	-
Mount Vernon EB left/thru | thru	B	15.1	0.16	47
Mount Vernon WB thru | thru	B	16.0	0.34	136
Mount Vernon WB right	A	6.1	0.11	36
Morrissey NB left | left	D	36.1	0.62	94
Morrissey NB thru | thru	C	27.4	0.40	83
Morrissey NB right	A	6.0	0.26	28
Morrissey SB left | left	C	34.5	0.55	92
Morrissey SB right	C	31.9	0.81	191
Unsignalized Intersections				
William J. Day Boulevard/Mount Vernon Street	**-**	-	-	-
William J. Day EB thru | thru/right	A	0.0	0.23	0
William J. Day WB left/thru | thru	B	10.5	0.48	65
Mount Vernon NB right	B	14.0	0.40	49
Mount Vernon Street/Mount Vernon Street Entrance	**-**	-	-	-
Mount Vernon EB left	A	8.3	0.04	3
Mount Vernon EB thru | thru/right	A	0.0	0.19	0
Mount Vernon WB left/thru | thru/right	A	0.2	0.12	0
Sovereign Bank Drive NB left/thru/right	E	43.6	0.70	121
Mount Vernon Street Entrance SB left/thru/right	B	14.5	0.17	15

= 95th percentile volume exceeds capacity; queue may be longer. Queue shown is after 2 cycles. m = volume for 95th percentile queue is metered by upstream signal.

As shown, during the AM peak hour the intersection of Mount Vernon Street/Morrissey Boulevard operates at an overall LOS F. This low LOS is driven by the lengthy queues encountered by traffic using the northbound left and through approaches; however, field observations showed that these queues generally clear and that the intersection processes traffic effectively. All of the rest of the approaches to this intersection operate at LOS C or better during the AM peak hour.

The other two intersections in the study area, Mount Vernon Street/Mount Vernon Street Entrance and William J. Day Boulevard/Mount Vernon Street are unsignalized and as such, LOS is measured by individual approach. For these two intersections, during the AM peak hour, all approaches operate at LOS C or better with the exception of the northbound right turn at William J. Day Boulevard/Mount Vernon Street which operates at LOS F. This low LOS is driven by the wait encountered by motorists at this stop-controlled approach; however, field observations showed that the queue at this intersection was processed effectively and that it did not have a negative impact on the intersection of Mount Vernon Street/Morrissey Boulevard immediately to the south.

During the PM peak hour, the intersection of Mount Vernon Street/Morrissey Boulevard operates at an overall LOS C. The individual approaches on the two unsignalized intersections all operate at LOS C or better with the exception of the northbound approach at Mount Vernon Street/Mount Vernon Street Entrance which operates at LOS E. This is consistent with the large number of vehicles exiting the Sovereign Bank Office parking lot and the delay they encounter attempting to enter the mainline of traffic without a signal.

4.2.5 PUBLIC TRANSPORTATION

The proposed Site is particularly well served by the MBTA, which operates one subway line, three commuter rail lines, and four bus routes within the quarter mile radius surrounding the proposed project. These routes are summarized in Table 4-4, Public Transportation, and shown graphically in Figure 4-5, 2012 Existing Conditions Public Transportation.

Table 4-4: Public Transportation

Route	Description	Rush hour Headway[1] (minutes)
Bus Routes		
5	City Point–McCormack Housing via Andrew Station	60*
8	Harbor Point/UMass–Kenmore Station via B.U. Medical Center & Dudley Station	14/25
16	Forest Hills Station–Andrew Station or UMass via Columbia Road	15/20

Route	Description	Rush hour Headway[1] (minutes)
41	Centre & Eliot Street–JFK/UMass Station via Dudley Station, Centre St. & Jackson Square Station.	26/30
Subway Routes		
Red Line	Alewife–Ashmont Station and Alewife–Braintree Station	9
Commuter Rail Routes		
Kingston/Plymouth	Kingston/Plymouth–South Station	47
Middleborough/ Lakeville	Middleborough/Lakeville–South Station	34
Greenbush	Greenbush–South Station	36

[1]Headway is the time between buses or trains.
Source: MBTA website—accessed April 24, 2012

Red Line Rapid Transit

The MBTA Red Line runs between Alewife Station in Cambridge, Braintree Station in Braintree, and Ashmont Station in Dorchester. JFK/UMass is the last Station prior to the line splitting into the Braintree and Ashmont branches. Both Ashmont and Braintree trains serve JFK/UMass, making it particularly convenient for transit users. The Red Line provides connections to South Station, downtown Boston, and much of Cambridge in addition to Dorchester, Quincy, and Braintree.

MBTA Bus Service

MBTA bus Route 5 operates along Old Colony Avenue in the transportation study area and stops at JFK/UMass Station. Route 5 provides a connection between the City Point Bus Terminal, near Castle Island, and the Andrew Square Station and JFK/UMass Stations, both of which are on the Red Line. Bus 8 runs between Kenmore Square Station on the Green Line and the campus of UMass Boston. It stops at JFK/UMass on the Red Line and operates on Mount Vernon Street in the project area. Route 16 operates between Forest Hills Station on the Orange Line and Andrew Square Station on the Red Line. During the AM and PM commuting peaks, Route 16 is extended and continues on to the UMass Boston bus way via Mount Vernon Street.

Of all the buses serving the project area, Routes 8 and 16 serve the Site most directly at Mount Vernon Street at Bayside Expo Center and 250 Mount Vernon

Street for outbound and inbound buses, respectively. Route 41 provides service between Centre Street/Eliot Street in Jamaica Plain and JFK/UMass on the Red Line. It provides connections to the Orange Line at Jackson Square and the Silver Line at Dudley Square.

MBTA Commuter Rail

The MBTA commuter rail Kingston/Plymouth, Middleborough/Lakeville, and Greenbush lines all pass through JFK/UMass Station. While every train running on these lines does not stop at JFK/UMass, enough do that depending on an individual's schedule, using the commuter rail could represent a faster trip to South Station than the Red Line which makes two intermediate stops at Andrew Square and Broadway Stations.

MASCO Longwood Medical Area (LMA) Shuttle

MASCO runs a free shuttle service for employees of the Longwood Medical Area institutions between JFK/UMass Station and the LMA approximately every ten minutes from 6:00-9:35 AM and 3:20-8:05 PM.

JFK/UMass Boston Shuttle Bus Service

UMass runs shuttle services from JFK/UMass Station serving the campus and other attractions on Columbia Point. Two routes are provided:

- **Route 1** buses run non-stop from JFK/UMass Station to the Campus Center, ***weekdays only***, every 5-7 minutes during the day and every 10-12 minutes after 9:30 PM.
- **Route 2** buses stop at the Campus Center, the Massachusetts Archives, the JFK Library, Clark Athletic Center Circle, and the University's Early Learning Center, ***seven days a week***, every 20 minutes between 8:00 AM and 5:45 PM on weekdays, between 7:40 AM and 7:00 PM on Saturdays, and between 8:00 AM and 5:45 PM on Sundays

4.2.6 PEDESTRIAN AND BICYCLE ACCOMMODATIONS

The public streets near the project generally provide good pedestrian access. All public streets have continuous sidewalks and the area has a considerable number of crosswalks with handicapped ramps. The one exception is the crosswalk located on the west side of the Mount Vernon Street/Mount Vernon Street Entrance intersection. This crosswalk consists of two segments with a median between them. The grass median does not have handicapped ramps or a street-level cut-out through it making this crosswalk non-ADA-compliant.

Bicycle volumes passing through the transportation study area intersections are generally low. The highest volumes were east and westbound through movements at the intersection of William J. Day Boulevard/Mount Vernon Street suggesting that most bicycle traffic in the area is generated by recreational riders following the waterfront.

Pedestrian volumes in the area are significantly higher than bicycle volumes. The largest pedestrian volumes in the study area are east-west movements at Mount Vernon Street/Morrissey Boulevard. This is consistent with the heavy flow of transit users to and from JFK/UMass Station during the commuting peaks. Bicycle and pedestrian volumes are shown in Figure 4-6, 2012 Existing Conditions Bicycle Volumes, and 4-7, 2012 Existing Conditions Pedestrian Volumes.

4.2.7 PARKING

For the purposes of this study, the Project team analyzed a one quarter mile radius around the Site. This industry-standard distance represents a seven-minute walk from a parked car to a destination for an average healthy person.

On-Street Parking

The vast majority of streets in the quarter mile radius around the Site do not permit curbside parking. Small areas of unrestricted on-street parking are available at the northwestern and western edges of the quarter mile zone on Von Hiller Street, Old Colony Avenue, Columbia Road, and Moseley Street. The streets immediately adjacent to Moseley Street, Snyder Street, Carson Street, and Cottage Street provide 2-hour parking, though vehicles with resident stickers are allowed to exceed this time limit. Practically speaking, given its distance from the Site and the barrier presented to pedestrians by I-93, the on-street parking in the project area will have relatively little impact on or interaction with the Project. On-street parking is presented in Figure 4-8, On-street Parking.

Off-Street Parking

The quarter mile area around the Site is richly supplied with off-street parking; however, it is all privately held and none is available to transient parkers. Table 4-5, Off-street Parking, below presents a midday observation, conducted on September 6th, 2012 showing to which entity each lot belongs, when it was observed, capacity, and spaces available at the time of observation. Figure 4-9, Off-street Parking, details each lot's location and ownership. Corcoran Jennison, owns parking lots on and around the Site (Corcoran Jennison 1) as well as a section of the large parking lot behind it containing approximately 208 spaces (Corcoran Jennison 2). Values given for the lot owned by UMass are approximate since this lot has been restriped many times and could be counted several different ways.

Table 4-5: Off-street Parking

Lot Owner	Time of Observation	Total Spaces	Spaces Available	Percent Occupied
Collegiate Charter School	12:24	9	3	66%
MBTA	12:28	45	6	86%
Apartment Block	12:30	47	33	30%
State Police[1]	12:38	59	15	75%
State Police[2]	12:43	33	15	55%
Corcoran Jennison 1	12:45	357	116	68%
DoubleTree at University Place	1:21	115	87	24%
Corcoran Jennison 2	1:27	208	208	0%
UMass Boston	1:35	1,322	762	42%
Geiger-Gibson Health Center	2:12	30	4	86%
St. Christopher's Catholic Church	2:19	94	19	80%
Sovereign Bank – Customers	2:27	41	19	54%
Sovereign Bank – Employees	2:47	637	180	72%

As the above table shows, the Project area has significant parking available in surface lots. In keeping with the 2011 Columbia Point Master Plan's recommendations, as the area is revitalized and becomes more transit-oriented, this supply of surface parking can be reduced significantly while still providing adequate parking for those who need it.

4.3 EVALUATION OF LONG-TERM IMPACTS

4.3.1 PROJECT CHARACTERISTICS

The proposed Project will include 184 apartment units, approximately 10,000 square feet of neighborhood commercial space, 76 underground parking spaces, and a total of 7 surface parking spaces, including 2 handicapped accessible spaces and 2 van accessible spaces. Access will be provided via the Mount Vernon Street Entrance to the south of the Site.

4.3.2 CONDITIONS ANALYZED

To determine traffic impacts of the Project, intersection operations were first analyzed for a five-year (2017) No-Build condition simulating conditions in the area if the project were not built. Then, project vehicular traffic was estimated and added to the roadway network, after which operations analysis was repeated for Build conditions.

4.3.3 2017 NO-BUILD CONDITIONS

This condition establishes a baseline for assessing the impacts of the proposed project and takes into account known effects on transportation conditions that will be felt in the horizon year of 2017. The future No-Build conditions are based on a background growth rate that accounts for other projects in the Boston area, population growth, and changes to the City's transportation infrastructure. An annual growth rate of 0.5 percent was applied to the existing intersection volumes to account for background growth.

Projected changes to the area also include The Residences at Morrissey Boulevard, which will be located on Morrissey Boulevard between the Shaw's supermarket and the JFK/UMass MBTA Station. The development was approved by the BRA on January 17, 2013 and will include 278 residential units, 143 parking spaces for residents, and new green space. During the AM peak hour, the volume of new vehicle trips associated with this project is small enough to be addressed by the background growth rate. However, during the PM peak hour, it is anticipated that an additional 46 vehicles will take the southbound right at Mount Vernon Street/Morrissey Boulevard to access the Residences. This volume has been added to this approach in addition to the overall No-Build increase in traffic.

UMass Boston is in the process of implementing a campus master plan, for which a new science building is under construction. UMass has also acquired the former Bayside Expo Center property adjacent to the Site. While a specific land use plan for this property has not yet been developed, a short-term plan to use the land for parking is under consideration. Also under construction is the Edward F. Kennedy Institute for the Study of the U.S. Senate adjacent to the JFK Library on Columbia Point.

Capacity analysis is presented in Table 4-6, No-Build Conditions (2017) AM Peak Hour, and Table 4-7, No-Build Conditions (2017) PM Peak Hour. Volumes are shown in Figure 4-10, No-Build Conditions AM Peak Hour Turning Movement, and Figure 4-11, No-Build Conditions AM Peak Hour Turning Movement.

Table 4-6: No-Build Conditions (2017) AM Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percentile Queue Length (feet)
Signalized Intersections				
Mount Vernon Street/Morrissey Blvd.	**F**	**>80.0**	**-**	**-**
Mount Vernon EB left/thru | thru	B	16.5	0.08	23
Mount Vernon WB thru | thru	B	18.6	0.31	80
Mount Vernon WB right	A	4.9	0.11	16
Morrissey NB left | left	F	>80.0	>1.0	#450
Morrissey NB thru | thru	F	>80.0	>1.0	#426
Morrissey NB right	B	18.8	0.35	74
Morrissey SB left | left	C	27.2	0.43	118
Morrissey SB right	B	16.6	0.58	78
Unsignalized Intersections				
William J. Day Boulevard/Mount Vernon Street	**-**	**-**	**-**	**-**
William J. Day EB thru | thru/right	A	0.0	0.32	0
William J. Day WEB left/thru | thru	B	10.1	0.37	42
Mount Vernon NB right	F	116.1	>1.0	569
Mount Vernon Street/Mount Vernon Street Entrance	**-**	**-**	**-**	**-**
Mount Vernon EB left	A	8.1	0.06	5
Mount Vernon EB thru | thru/right	A	0.0	0.18	0
Mount Vernon WB left/thru | thru/right	A	0.5	0.11	1
Sovereign Bank Drive NB left/thru/right	C	21.5	0.26	26
Mount Vernon Street Entrance SB left/thru/right	B	13.9	0.19	17

=95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles. m = volume for 95th percentile queue is metered by upstream signal.

Table 4-7: No-Build Conditions (2017) PM Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th PercentileQueue Length (ft)
Signalized Intersections				
Mount Vernon Street/Morrissey Blvd.	**C**	**25.9**	**-**	**-**
Mount Vernon EB left/thru | thru	B	16.7	0.18	50
Mount Vernon WB thru | thru	B	17.9	0.37	141
Mount Vernon WB right	A	6.7	0.12	37
Morrissey NB left | left	D	36.4	0.63	96
Morrissey NB thru | thru	C	25.0	0.35	83
Morrissey NB right	A	5.4	0.24	27
Morrissey SB left | left	C	34.6	0.56	94
Morrissey SB right	D	35.6	0.85	238
Unsignalized Intersections				
William J. Day Boulevard/Mount Vernon Street	**-**	-	-	-
William J. Day EB thru | thru/right	A	0.0	0.24	0
William J. Day WB left/thru | thru	B	10.9	0.50	70
Mount Vernon NB right	C	16.5	0.42	52
Mount Vernon Street/Mount Vernon Street Entrance	**-**	-	-	-
Mount Vernon EB left	A	8.3	0.04	3
Mount Vernon EB thru | thru/right	A	0.0	0.20	0
Mount Vernon WB left/thru | thru/right	A	0.2	0.13	0
Sovereign Bank Drive NB left/thru/right	F	50.2	0.75	137
Mount Vernon Street Entrance SB left/thru/right	B	14.7	0.17	15

=95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles. m = volume for 95th percentile queue is metered by upstream signal.

As Tables 4-6 and 4-7 show, under No-Build conditions very little changes between 2012 and 2017. Under AM peak hour No-Build conditions, the only change is the westbound approach of William J. Day Boulevard/Mount Vernon Street which drops from LOS A to LOS B. In the PM peak hour, the northbound Sovereign Bank approach at Mount Vernon Street/Mount Vernon Street Entrance falls from LOS E to LOS F and traffic exits from the bank's parking lot and the southbound right-turn at Mount Vernon Street/Morrissey Boulevard drops from LOS C to LOS D.

4.3.4 2017 BUILD CONDITIONS

Impacts associated with 2017 Build conditions are predicted by adding the anticipated impacts of the proposed project to the transportation system as described in the 2017 No-Build conditions. The future Build condition therefore illustrates the impact of the proposed project relative to the No-Build condition. The steps in performing this analysis are discussed below.

Trip Generation

The trips associated with the proposed project have been estimated and are presented in this section. The trip generation differentiates between "unadjusted" vehicle trips, as would be made if the project were located in an area without transit service, and adjusted vehicle trips, which accounts for the availability of transit and cycling/walking options.

To estimate project trips, the Institute of Transportation Engineers (ITE) *Trip Generation, 9th Edition* manual was used as a starting point. For this analysis ITE land use codes LUC 220 for apartments and LUC 820 for retail were used, as described below:

- **ITE Land Use Code 220 - Residential Apartment**

  Apartments are defined as rental dwelling units in the same building as at least three other such units. Calculations of the number of trips use ITE's equation per number of dwelling units.

- **ITE Land Use Code 820 - Retail/Shopping**

  A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. Since LUC 820 yields a high number of trips, it was chosen to be most conservative (highest impact). Calculations of the number of trips use ITE's average rate per 1,000 sf.

Since the ITE trip generation rates are based on empirical vehicular traffic count data, the "unadjusted" ITE trips must be converted into person trips, which are then allocated by mode. To convert the vehicle trips into person trips, a vehicle occupancy rate (VOR) of 1.2 for the project's residential component and 1.8 for the retail, as derived from the 2000 U.S. Census Journey to Work Data and the Nationwide Personal Transportation Survey was used. Then, to convert person trips by auto back into vehicle trips for analysis purposes, a local VOR of 1.25 was used for the residential component. The VOR associated with the retail remained at 1.8.

Mode Share

The project is well placed to take advantage of alternative transportation to reduce automobile mode share. MBTA Red Line, Commuter Rail, and bus connections to downtown Boston and points across the city are available at the JFK/UMass Station within a 5-minute walk of the Site. Given the ease of accessing transit and the expense of parking in downtown Boston, it is highly likely that many of the project's residents will opt to use public transit. The project is also well-placed with regard to cycling. Bicyclists looking to access downtown would have a relatively short, straight and flat commute to Boston's core via Old Colony Avenue and Dorchester Avenue.

The mode split assumptions for trips generated by the project, shown in Table 4-8, Project Mode Splits, are based on Boston Transportation Department (BTD) data for area 8. It is expected that the vehicle share for the retail component of the project may well be lower than the 61-65% shown in Table 4-8 given that the shop will be neighborhood-focused, part of a transit oriented development, and not the type of "destination" commercial space likely to generate significant automobile trips. Nonetheless, the standard BTD mode splits were used to obtain a conservative estimate of new vehicle trips.

Table 4-8: Project Mode Splits

Use	Automobile	Public Transportation	Walk / Bicycle / Other
Daily			
Residential	53%	23%	24%
Retail	61%	15%	24%
AM Peak Hour			
Residential	44%	26%	30%
Retail	65%	15%	20%
PM Peak Hour			
Residential	44%	26%	30%
Retail	65%	15%	20%

Table 4-9, Project Trips by Mode, shows the resulting daily and peak hour trips via each mode after adjustment to reflect local conditions. A detailed trip generation table is shown in Appendix 1 showing unadjusted vehicle trips, auto occupancy rates, transit trips, walk trips, and adjusted vehicle trips.

Table 4-9: Project Trips by Mode

Time Period	Adjusted Vehicle Trips	Public Transportation Trips	Walk / Bicycle / Other Trips
Residential Option			
Daily	898	461	546
AM Peak Hour	47	34	37
PM Peak Hour	73	52	56

Trip Distribution

The resulting vehicle trips were assigned to the roadway network based on Central Transportation Planning Staff (CTPS) data as specified by Boston Transportation Department (BTD) guidelines. The expected vehicle distribution for the proposed project is shown in Figure 4-12, Entering Trip Distribution and Figure 4-13, Existing Trip Generation. 2017 Build conditions peak hour turning movements, with project trips included, are shown in Figure 4-14, 2017 Build Conditions AM Peak Hour, and Figure 4-15, 2017 Build Conditions PM Peak Hour.

Traffic Impacts

The adjusted vehicle trips have been distributed onto the roadway traffic network and their impacts have been assessed. The traffic impacts of the proposed project will be concentrated on the streets providing access to and from the Site: Mount Vernon Street, Morrissey Boulevard, and William J. Day Boulevard. Intersections studied for traffic impacts include the following:

- Mount Vernon Street Entrance/Mount Vernon Street
- Mount Vernon Street/Morrissey Boulevard
- Mount Vernon Street/William J. Day Boulevard

Build Conditions intersection operations analysis is presented in Table 4-10, Build Conditions (2017) AM Peak Hour, and Table 4-11, Build Conditions (2017) PM Peak Hour.

Table 4-10: Build Conditions (2017) AM Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percentile Queue Length (feet)
Signalized Intersections				
Mount Vernon Street/Morrissey Blvd.	**F**	**>80.0**	**-**	**-**
Mount Vernon EB left/thru | thru	B	16.5	0.08	24
Mount Vernon WB thru | thru	B	18.6	0.31	80
Mount Vernon WB right	A	4.9	0.11	16
Morrissey NB left | left	F	>80.0	>1.0	#450
Morrissey NB thru | thru	F	>80.0	>1.0	#426
Morrissey NB right	B	18.8	0.35	75
Morrissey SB left | left	C	27.4	0.45	122
Morrissey SB right	B	16.6	0.58	78
Unsignalized Intersections				
William J. Day Boulevard/Mount Vernon Street	**-**	-	-	-
William J. Day EB thru | thru/right	A	0.0	0.32	0
William J. Day WEB left/thru | thru	B	10.3	0.37	43
Mount Vernon NB right	F	>80.0	>1.0	584
Mount Vernon Street/Mount Vernon Street Entrance	**-**	-	-	-
Mount Vernon EB left	A	8.1	0.08	6
Mount Vernon EB thru | thru/right	A	0.0	0.18	0
Mount Vernon WB left/thru | thru/right	A	0.5	0.11	1
Sovereign Bank Drive NB left/thru/right	D	26.0	0.31	32
Mount Vernon Street Entrance SB left/thru/right	B	13.7	0.26	26

=95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles. m = volume for 95th percentile queue is metered by upstream signal.

Table 4-11: Build Conditions (2017) PM Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percentile Queue Length (feet)
Signalized Intersections				
Mount Vernon Street/Morrissey Boulevard	**C**	**26.3**	**-**	**-**
Mount Vernon EB left/thru | thru	B	16.9	0.19	52
Mount Vernon WB thru | thru	B	18.4	0.40	151
Mount Vernon WB right	A	7.2	0.13	40
Morrissey NB left | left	D	36.4	0.63	96
Morrissey NB thru | thru	C	24.7	0.35	83
Morrissey NB right	A	5.3	0.24	28
Morrissey SB left | left	D	36.5	0.63	105
Morrissey SB right	D	36.3	0.86	244
Unsignalized Intersections				
William J. Day Boulevard/Mount Vernon Street	**-**	-	-	-
William J. Day EB thru | thru/right	A	0.0	0.26	0
William J. Day WB left/thru | thru	B	11.4	0.51	75
Mount Vernon NB right	C	17.0	0.43	54
Mount Vernon Street/Mount Vernon Street Entrance	**-**	-	-	-
Mount Vernon EB left	A	8.5	0.09	7
Mount Vernon EB thru | thru/right	A	0.0	0.20	0
Mount Vernon WB left/thru | thru/right	A	0.2	0.13	0
Sovereign Bank Drive NB left/thru/right	F	>80.0	0.93	196
Mount Vernon Street Entrance SB left/thru/right	C	17.0	0.21	19

=95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles. m = volume for 95th percentile queue is metered by upstream signal.

Due to the relatively modest number of new vehicle trips contributed to the local network by the project, the impact of project trips on the performance of the study area intersections is minor. During the AM peak hour, there is only one change in LOS—the northbound approach at the Mount Vernon Street/Mount Vernon Street Entrance drops from LOS C under No-Build conditions to LOS D. As noted previously, LOS D is considered acceptable in an urban environment during the peak hours.

There are two moderate changes triggered by the Build traffic volumes during the PM peak hour. As compared to the No-Build condition where it operates at LOS B, the northbound right at William J. Day Boulevard/Mount Vernon Street drops to LOS C. Similarly, the southbound approach at Mount Vernon Street/Mount Vernon Street Entrance goes from LOS B under No-Build conditions to LOS C in the Build conditions. Again, these peak hour LOS values are considered acceptable in urban areas.

Public Transit

It is likely that the majority of public transit trips to and from the project will be via the Red Line although the commuter rail and local bus service will also likely carry a share of transit users. This reflects the concentration of employment in downtown Boston, the relative speed of the Red Line as compared to area streets or I-93 during the peak hours, and the high cost of parking in downtown. In addition, the MASCO shuttle directly to the Longwood Medical Area may prove to be an attractive service for employees who chose to live at the Residences at University Place.

Bicycle Amenities

A major goal of the Project is to encourage multi-modal transportation, including transportation by bicycle. The project will provide 188 secure, easily accessible, interior bicycle parking spaces on the ground floor on the north side of the new building. In addition, a Hubway station with 15 docks is located 0.1 miles from the Site.

Parking

BTD has established parking space guidelines throughout the City of Boston to ensure that the proper parking capacity is provided with new developments. For the project area, for both retail and residential uses, this ratio is 0.75-1.25 parking spaces per dwelling unit or square foot of retail space. The parking ratio for this project will be 0.52 per unit. While this is lower than the BTD standard, it is in keeping with the project's Transit Oriented Development (TOD) goals where individuals without cars will purposefully choose to locate. In addition, the ratio of 0.52 is identical to what will be provided at the nearby Residences at Morrissey

Boulevard. Given the project's close proximity to transit and a Hubway bicycle rental station, the lower ratio of 0.52, more in alignment with the 0.38 to 0.74 range admissible for downtown Boston, is appropriate.

The Residences at University Place will contain 76 underground parking spaces and 7 surface spaces, 2 of which will be designated for use by handicapped motorists and 2 of which will be for accessible vans. The Project will also include zipcar parking. Overflow parking, if any, will be accommodated in the adjacent parcel owned by Corcoran Jennison to the north. The reduction in off-street parking associated with the project supports the vision expressed in the 2011 Columbia Point Master Plan, which notes that excessive surface parking in the area undermines the City's goals of minimizing automobile travel, promoting pedestrian activity and expanding transit and bicycle use.

Service and Loading

Service and loading requirements for the project will be modest. Most service and loading requirements will be limited to move-in/move-out, trash pickup from the residences and trash pickup, and occasional deliveries for the retail. These activities will be accommodated onsite, with no impacts on public streets.

Transportation Demand Management (TDM)

The project proponents will implement a travel demand management (TDM) program in order to reduce automobile travel, automobile ownership and traffic impacts associated with the proposed project.

The TDM measures to be implemented by the project will include the following:

- Parking management;
- Promotion of public transit and dissemination of transit information;
- Secure, internal bicycle storage for project residents;
- Publicly accessible bicycle storage for project visitors;
- An electric vehicle charging station on Site;
- Zipcar parking on the Site.

The proponents will work with BTD to determine an appropriate TDM program and will formalize this program in a Transportation Access Plan Agreement (TAPA).

University Place Residences
Dorchester, Massachusetts

Figure 4-1
Locus Map
Source: USGS

University Place Residences
Dorchester, Massachusetts

Figure 4-2
Study Area Intersections
Source: Howard/Stein-Hudson Associates, Inc., 2012

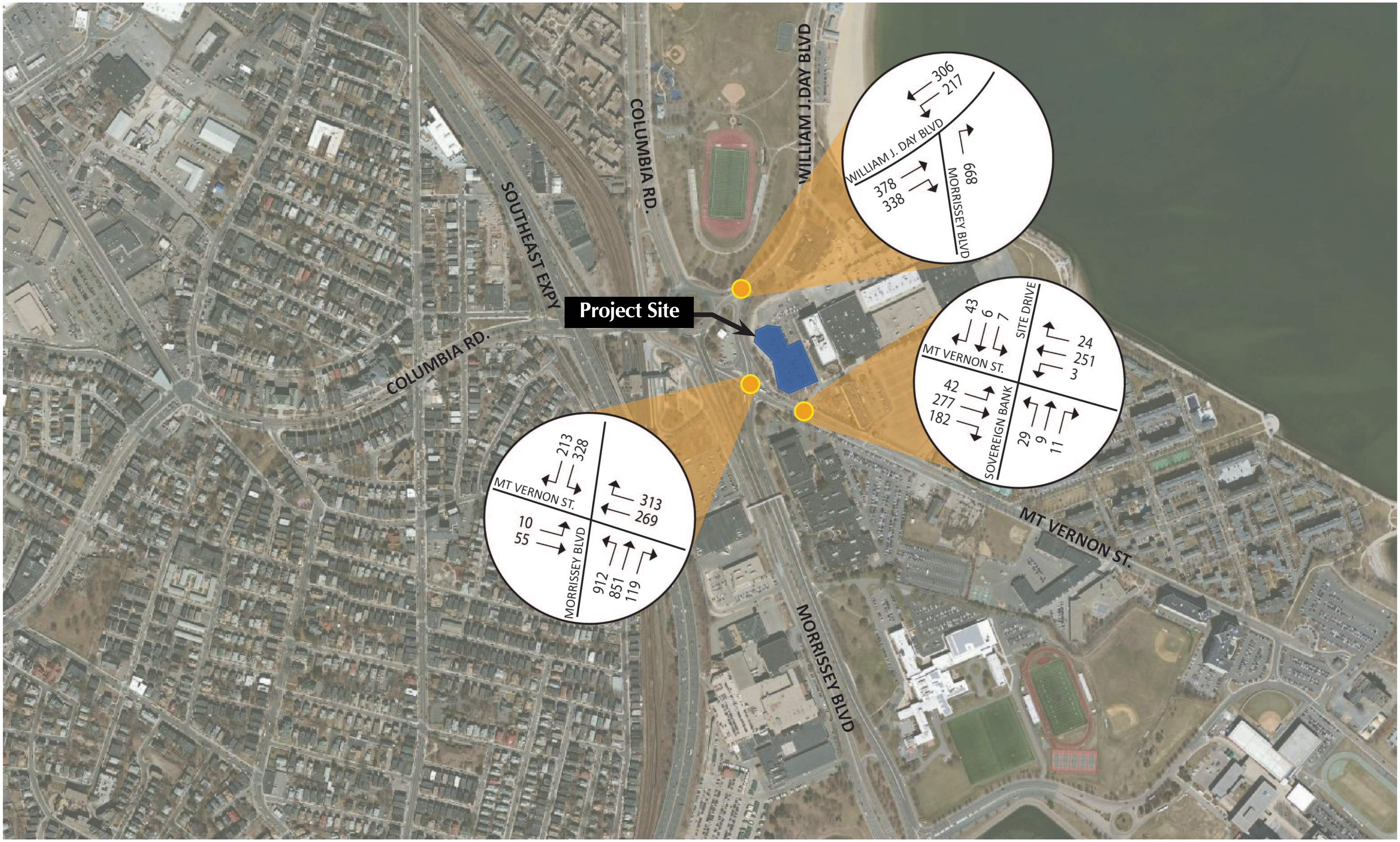
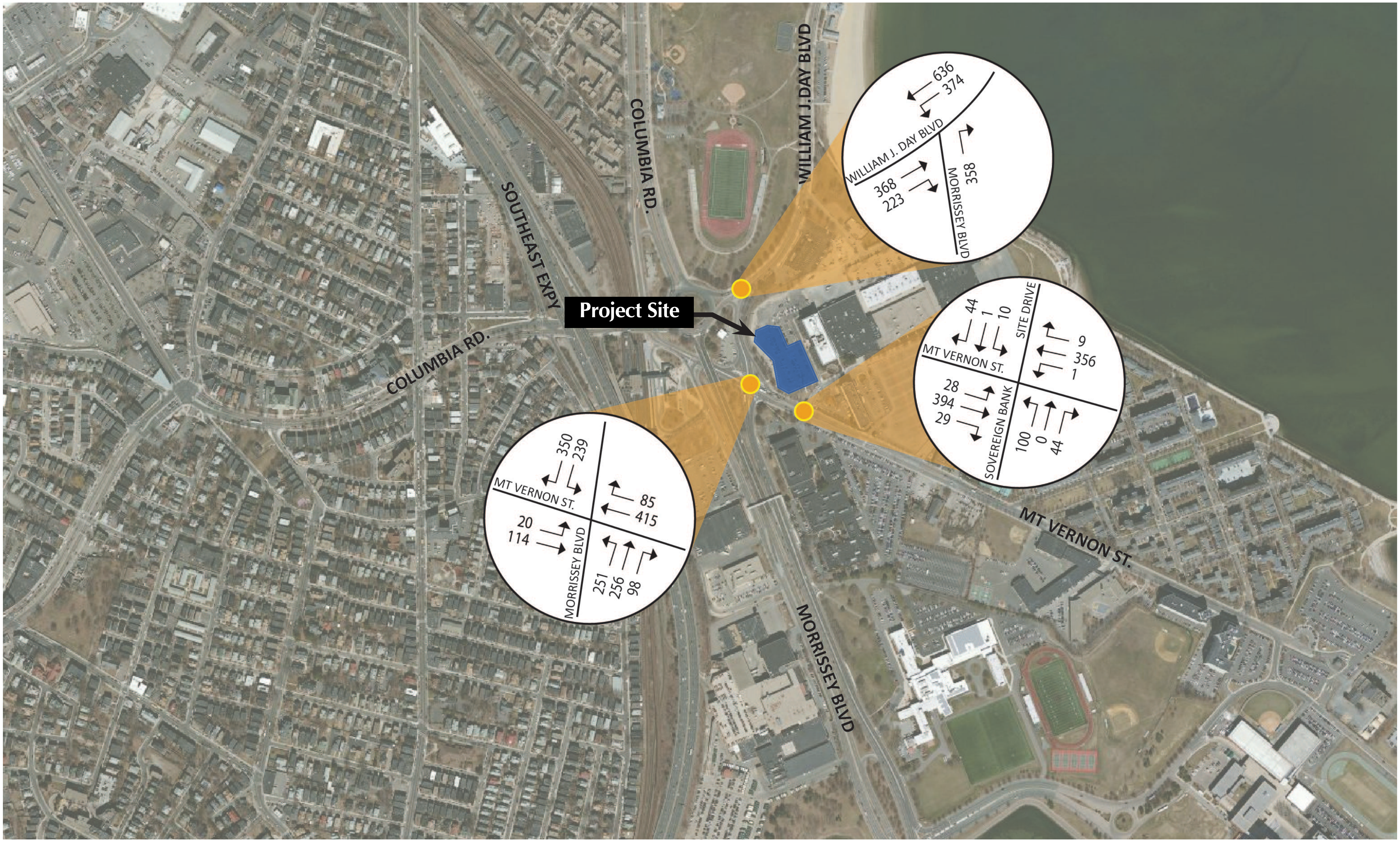


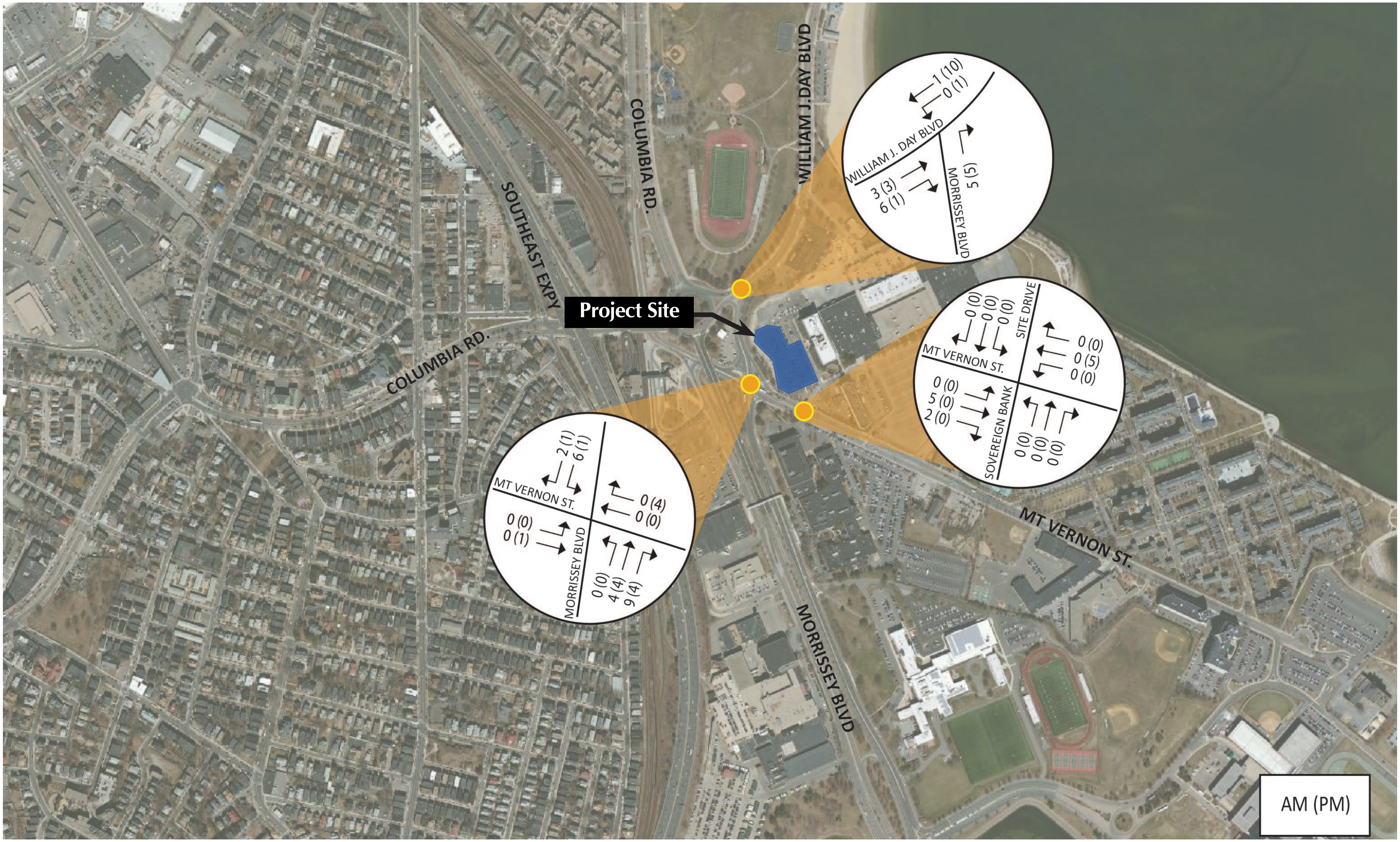
Figure 4-3
2012 Existing Conditions AM Peak Hour
Source: Howard/Stein-Hudson Associates, Inc., 2012



University Place Residences
Dorchester, Massachusetts

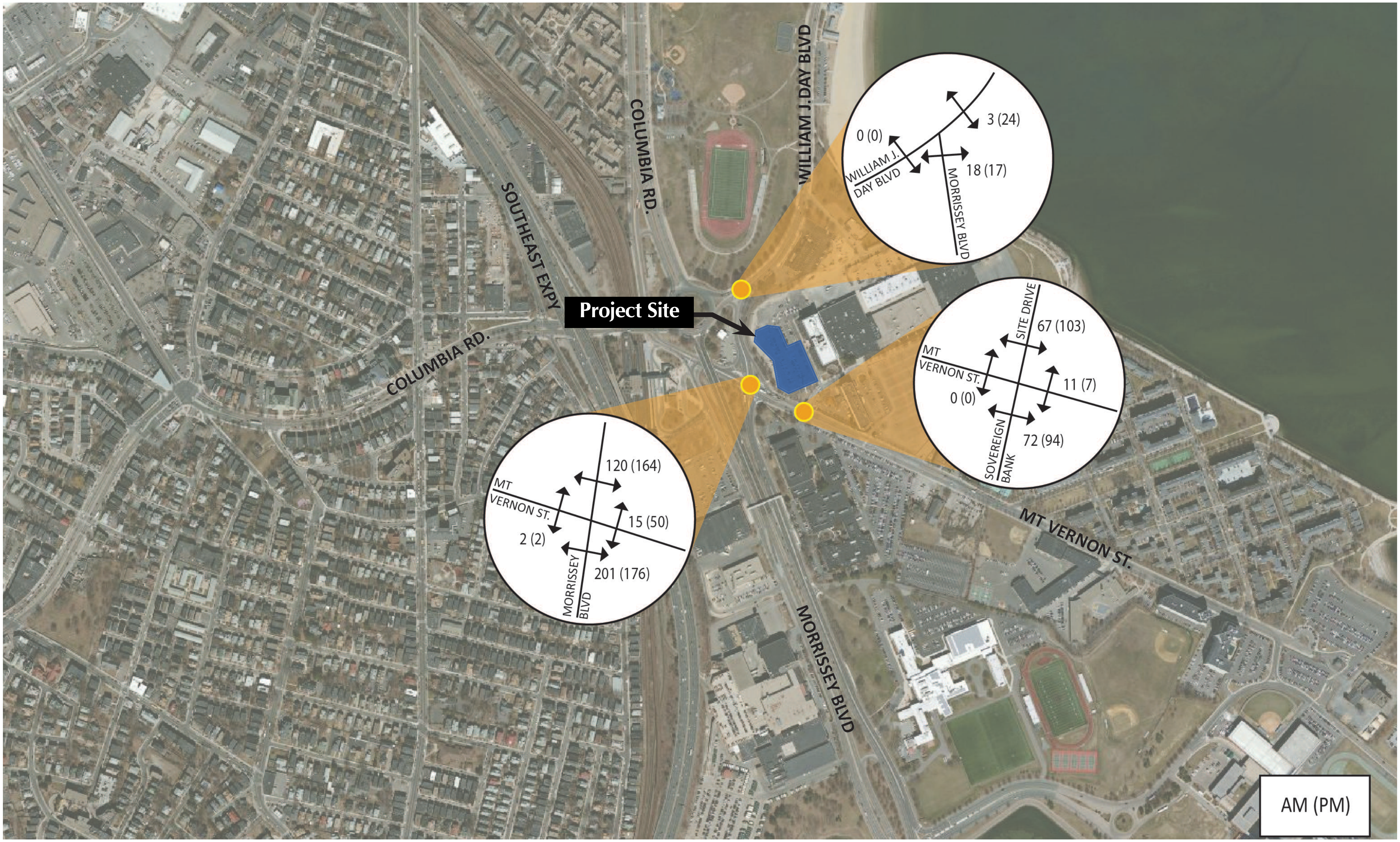
Figure 4-4
2012 Existing Conditions PM Peak Hour
Source: Howard/Stein-Hudson Associates, Inc., 2012

Figure 4-5
2012 Existing Conditions Public Transportation
Source: Howard/Stein-Hudson Associates, Inc., 2012



University Place Residences
Dorchester, Massachusetts

Figure 4-6
2012 Existing Conditions Bicycle Volumes
Source: Howard/Stein-Hudson Associates, Inc., 2012



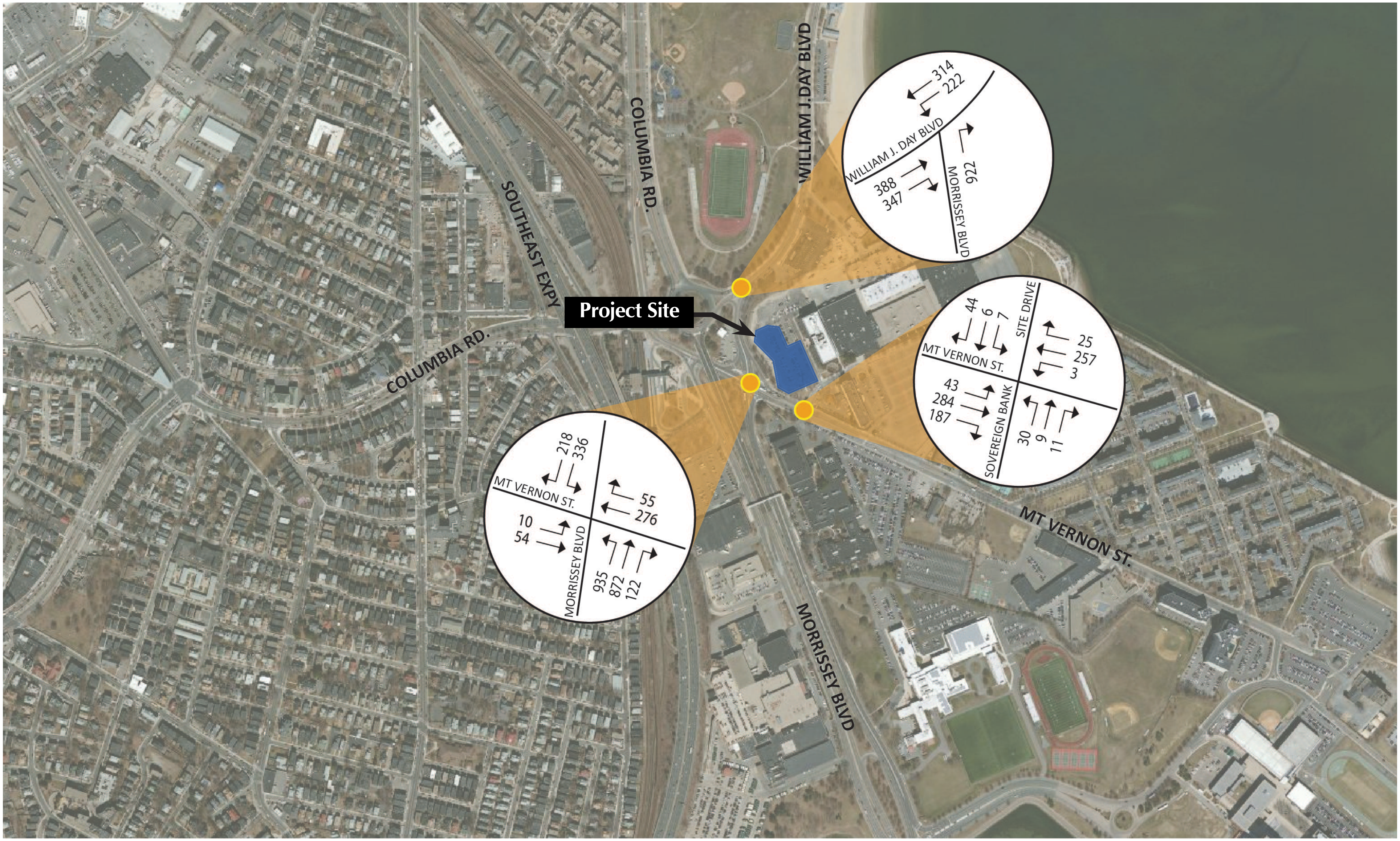
University Place Residences
Dorchester, Massachusetts

Figure 4-7
2012 Existing Conditions Pedestrian Volumes
Source: Howard/Stein-Hudson Associates, Inc., 2012

Figure 4-8
On-street Parking
Source: Howard/Stein-Hudson Associates, Inc., 2012

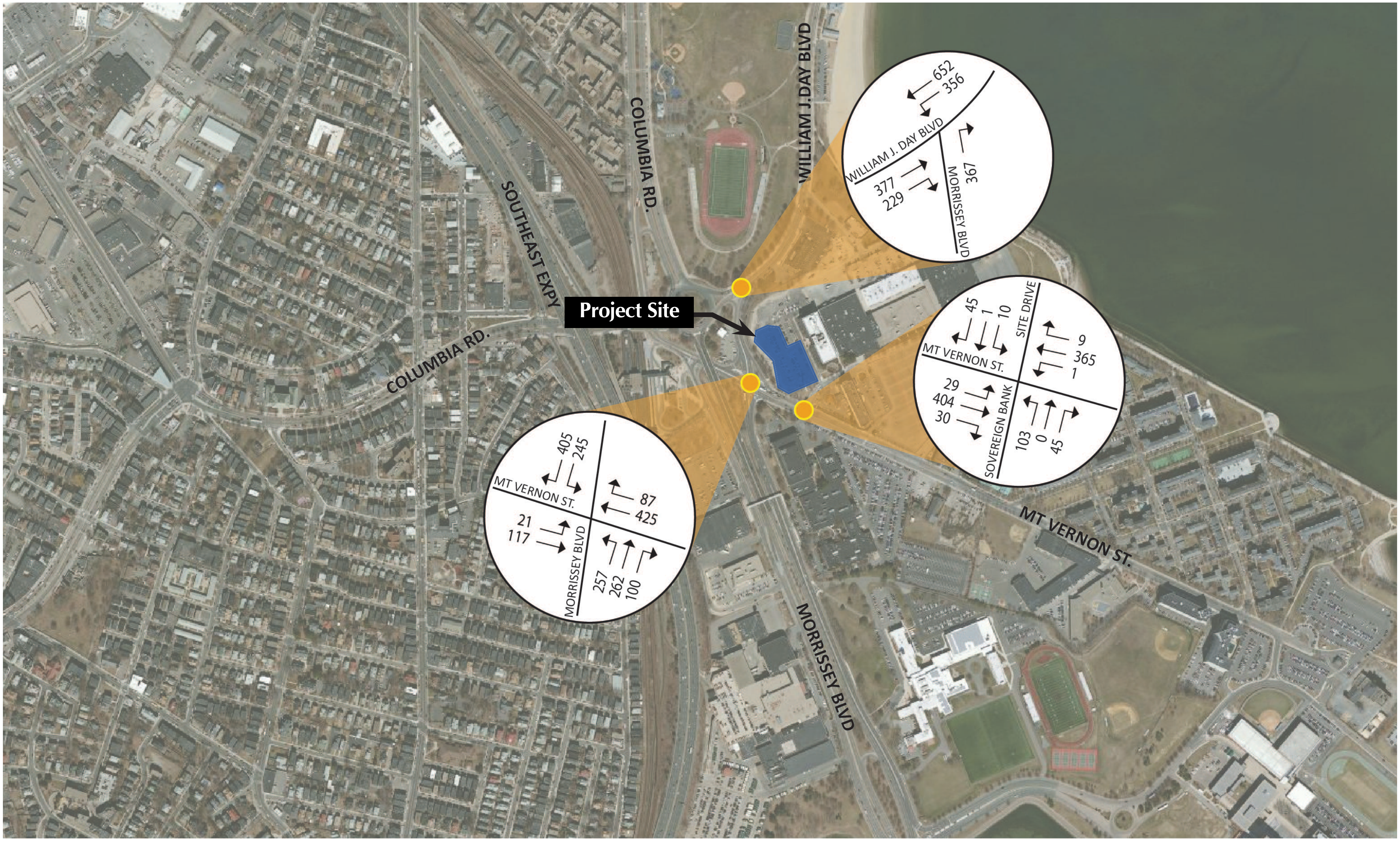
University Place Residences
Dorchester, Massachusetts

Figure 4-9
Off-street Parking
Source: Howard/Stein-Hudson Associates, Inc., 2012



University Place Residences
Dorchester, Massachusetts

Figure 4-10
No-Build Conditions AM Peak Hour
Source: Howard/Stein-Hudson Associates, Inc., 2012



University Place Residences
Dorchester, Massachusetts

Figure 4-11
No-Build Conditions PM Peak Hour
Source: Howard/Stein-Hudson Associates, Inc., 2012

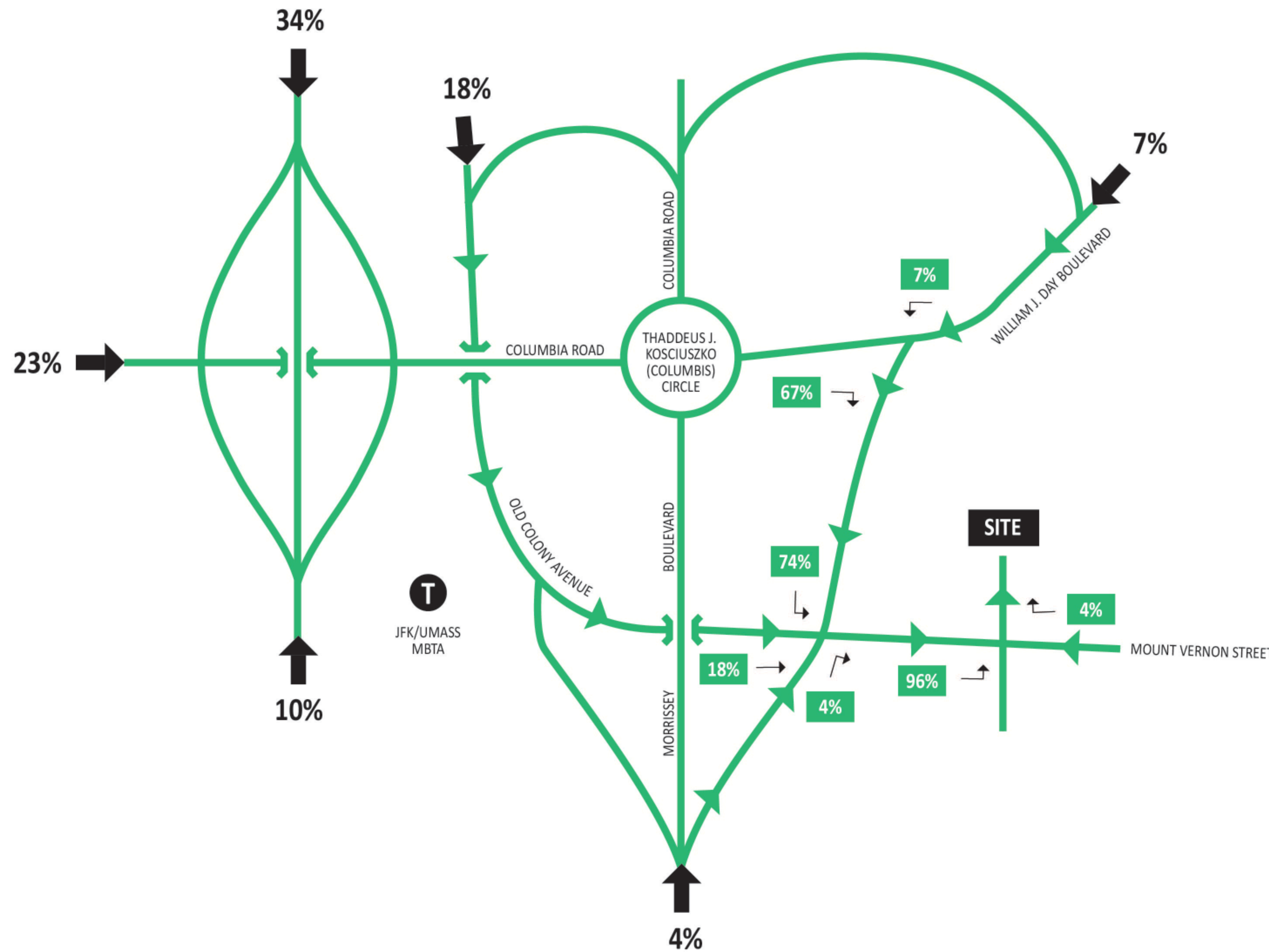
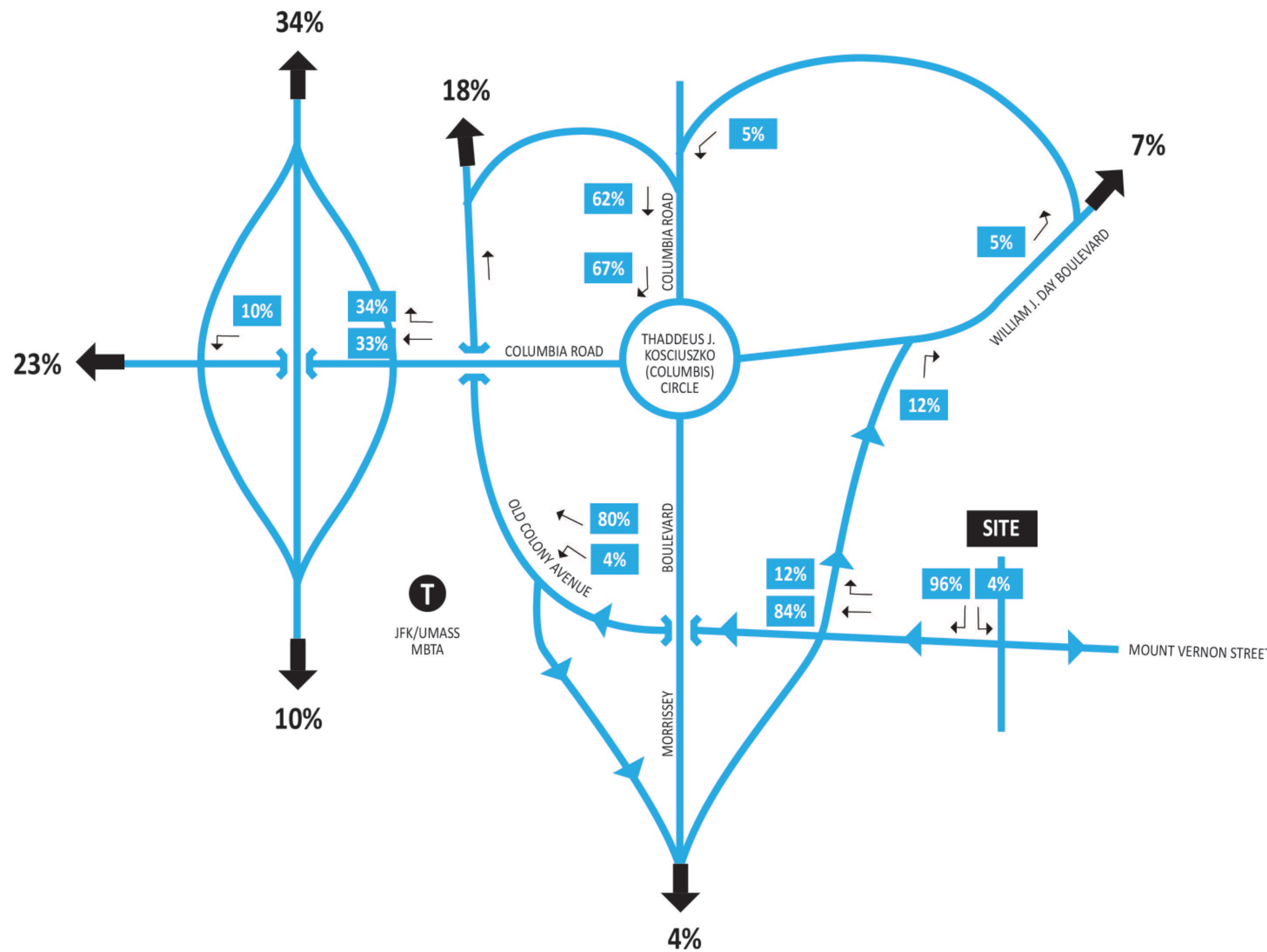
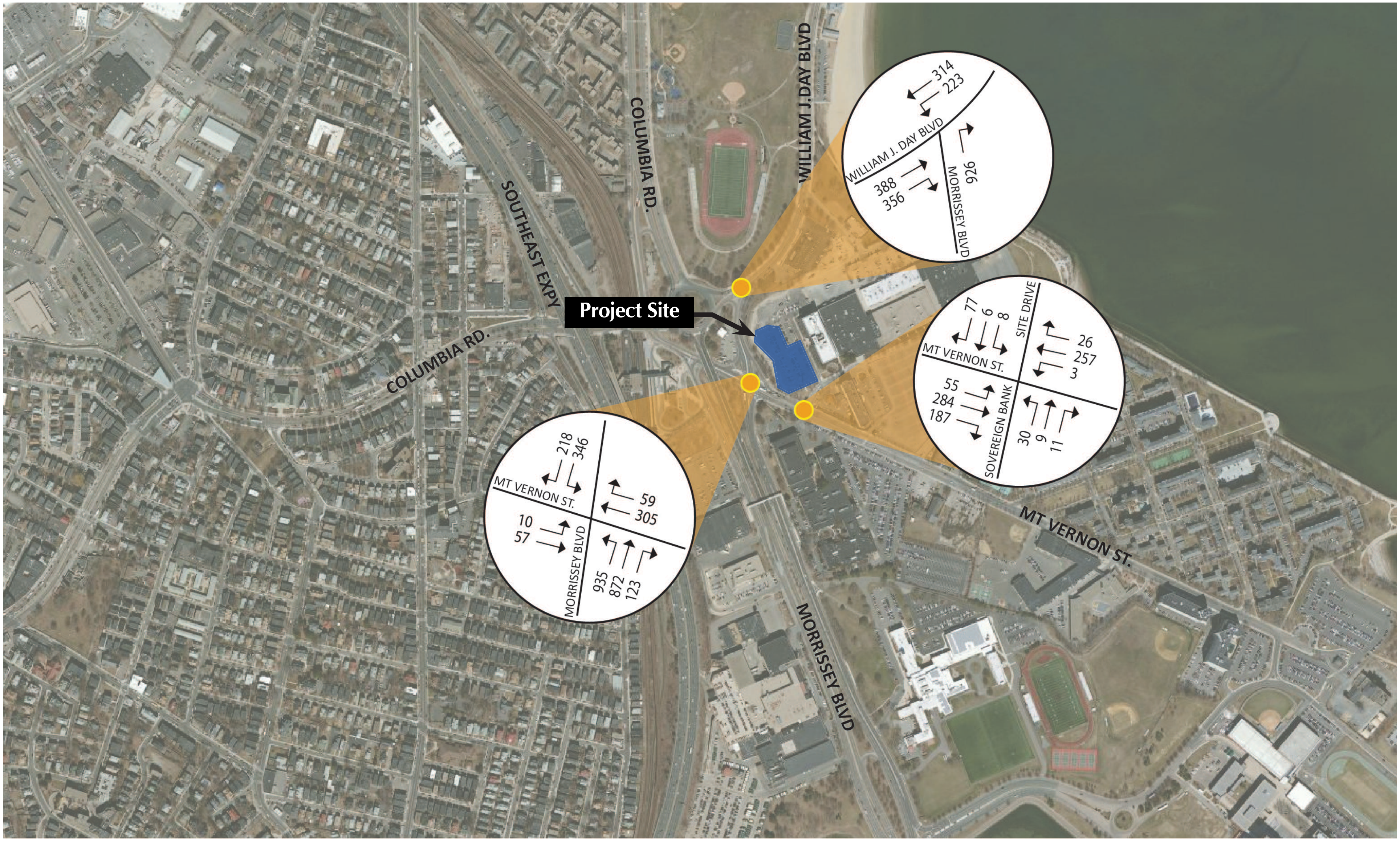


Figure 4-12
Entering Trip Distribution
Source: Howard/Stein-Hudson Associates, Inc., 2012



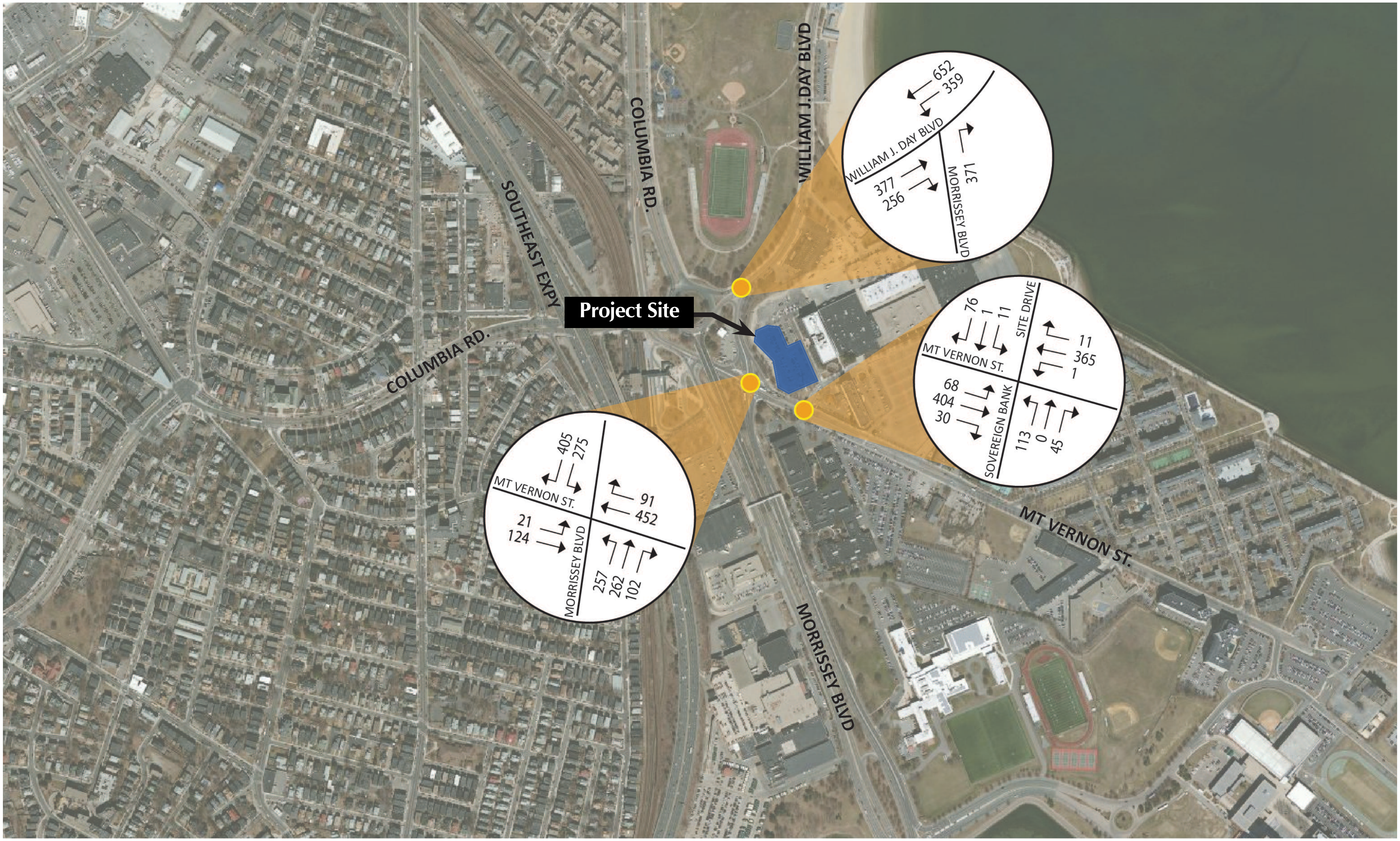
University Place Residences
Dorchester, Massachusetts

Figure 4-13
Exiting Trip Distribution
Source: Howard/Stein-Hudson Associates, Inc., 2012



University Place Residences
Dorchester, Massachusetts

Figure 4-14
2017 Build Conditions AM Peak Hour
Source: Howard/Stein-Hudson Associates, Inc., 2012



University Place Residences
Dorchester, Massachusetts

Figure 4-15
2017 Build Conditions PM Peak Hour
Source: Howard/Stein-Hudson Associates, Inc., 2012

Chapter 5

ENVIRONMENTAL PROTECTION

CHAPTER 5: ENVIRONMENTAL PROTECTION

5.1 INTRODUCTION

University Place Residences (the "Project") at 140-144 Mount Vernon Street will be built in full compliance with local, state, and federal environmental regulations and will substantially improve the environmental conditions of the Site. The Project will not create undue wind, shadow, noise, solar glare, or air quality impacts in the surrounding area. It will remediate contaminated soil conditions and will follow an appropriate construction management plan to avoid or mitigate construction period impacts. In addition, while partially located within an existing 100-year flood plain, the Project will elevate portions of the Site by fill and incorporate other key measures to protect against sea level rise.

5.2 WIND

The Project will be constructed on an existing surface parking lot and include a 6-story, irregular L-shaped structure. The Project is not expected to significantly change wind levels in the vicinity due to the low height of the proposed new building. There will be very few buildings located in close proximity to the new building and its longest elevation will front on Mount Vernon Street, a wide road. Without a tight, urban grid system, the Project will not produce the wind tunnel effect common to more densely built areas.

As a result of the placement of the proposed new building in the existing, low density context, Pedestrian Level Winds (PLWs) along adjacent sidewalks are not anticipated to exceed the BRA guidelines of wind speeds of 31 miles per hour.

5.3 SHADOW

A shadow analysis was conducted for the Project to ensure that the proposed new building not create adverse shadow impacts. Table 5-1, Shadow Study Dates and Times, identifies the dates and times for which shadow conditions have been simulated.

Table 5-1: Shadow Study Dates and Times

Date	Time
Vernal Equinox – March 21st	9:00 AM, 12:00 noon, 3:00 PM
Summer Solstice – June 21st	9:00 AM, 12:00 noon, 3:00 PM
Autumnal Equinox – September 21st, EDT	9:00 AM, 12:00 noon, 3:00 PM
Winter Solstice – December 21st, EST	9:00 AM, 12:00 noon, 3:00 PM

The following description is in reference to the shadow study images shown in Figures 5-1 through 5-4, Shadow Studies. All new shadows projected from the Project are indicated in gray and existing building shadows shown in blue.

Vernal Equinox – March 21st (Figure 5-1)

At 9 AM, shadows are cast in a northwesterly direction onto DCR roadways.

At noon, the building casts shadows in a northerly direction. This leaves sidewalks in front of the building free of shadow. Only a very small portion of the adjacent Parking Parcel to the north is affected.

At 3 PM, shadows are cast to the northeast and are confined entirely to the project site, except for a small portion of the southwest corner of the adjacent Parking Parcel to the north.

Summer Solstice – June 21st (Figure 5-2)

At 9 AM, shadows are cast to the west of the Site. A portion of the DCR roadways are cast in shadow.

At noon, a very small shadow is cast to the north but remains entirely confined to the Site.

At 3 PM, shadows fall toward the east but remain almost entirely confined to the Site, except for a very small section of the landscaped area in the southwest corner of the University Place Office Center to the east.

Autumnal Equinox – September 21st (Figure 5-3)

At 9 AM, shadows are cast in a northwesterly direction onto the DCR roadways.

At noon, the building casts shadows in a northerly direction. This leaves sidewalks on the DCR roadways free of shadow. Only a very small portion of the adjacent site to the north, the Parking Parcel, is affected.

At 3 PM, shadows are cast to the northeast and are confined entirely to the Site, except for a small portion of the southwest corner of the Parking Parcel to the north.

Winter Solstice – December 21st (Figure 5-4)

The longest shadows of the year occur during the winter solstice. At 9 AM, shadow is cast to the northwest across a section the DCR roadways as far as Kosciuszko Circle.

At noon, shadows are cast to the northwest. Outside of the Site, shadows affect a portion of the adjacent parking lot and a negligible portion of the DCR roadways.

At 3 PM, shadows cover the entire Site. Beyond the Site, shadows extend to the northeast, covering a portion of the DCR roadways, a portion of the Parking Parcel, and a portion of the parking lot for a State Police Building.

Overall, due to the low density of the surrounding area, the shadow impacts of this site on existing buildings or important public spaces are minimal. The orientation of the building causes the majority of shadows fall within the existing site. These shadows occur primarily in the winter and to a lesser extent in the fall.

5.4 DAYLIGHT

The project is being constructed in relatively a low-density area for an urban setting. The width of Mount Vernon Street and the absence of a street wall on the other side of it will ensure adequate daylight on the west side of the building. The generous open space between the existing office building to the east and the new residential building will ensure sufficient daylight on the east side of the building.

5.5 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 in front of the primary building façade will further serve to absorb sunlight to minimize its reflection off of the building onto the street and sidewalk.

5.6 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 5.12, Construction Impacts.

5.6.1 TRAFFIC SOURCES

Due to the relatively modest number of 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.

While the LOS is expected to fall from a C to a D at the unsignalized intersection at Mount Vernon Street/Mount Vernon Street Entrance coming northbound along the Mount Vernon Street Entrance, the increase in traffic anticipated is less than 10%. As shown in Chapter 4, there are no other intersections where LOS is expected to fall to a D or lower and there are no intersections where LOS is an E or an F and the project contributes to a reduction in LOS. For this reason, no mesoscale air quality analysis was performed for the Project.

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 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 residents;
- Publicly accessible bicycle storage for project visitors;
- An electric vehicle charging station on Site;
- Zipcar parking on the Site.

5.6.2 PARKING SOURCES

The Site is currently entirely a paved parking lot. The project will result in a reduction from 231 to 83 parking spaces, which will include 76 underground spaces and 7 surface parking spaces (including 2 accessible spaces and 2 van accessible spaces). This net reduction of 148 spaces will result in an improvement in existing air quality due to parking sources. The garage parking will be mechanically exhausted and exhaust vents will be located away from building intakes and primary pedestrian areas. In keeping with Boston's Complete Streets Guidelines, a bicycle parking ratio of over 1 space per residential unit will be created to encourage bicycle use and help reduce parking demand. Combined, these factors will minimize air pollution from parking sources associated with the Project.

5.6.3 BUILDING OPERATION SOURCES

An emergency generator will be located between the ramp to the below-grade parking garage and the east side of the building. It will be in compliance with Department of Environmental Protection (DEP) standards. There will be individual heating units for the residential apartments and a condenser will be located on the roof. The ground floor common areas will have a central heating and cooling unit. There will be 2 exhaust areaways (grates in the ground) for the parking garage. One will be located outside of the utility room and one will be located outside of the bicycle storage room to the east hidden by bushes. The garage door will provide fresh air intake into the garage. In combination, these building operation factors are not expected to contribute to significant changes in air quality.

5.7 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 small rooftop condensing units serving individual apartments, rooftop air conditioning unit serving common areas and commercial areas, rooftop exhaust fans, garage exhaust fans, and ground mounted emergency generator and transformer equipment. Based on the general equipment design, the rooftop equipment is not expected to produce significant sound levels at the building property lines, though they will be and will have noise control measures provided if required. The garage exhaust fans and electrical transformer sound levels will be assessed, and noise control measures will be provided if necessary. The emergency generator mechanical and combustion exhaust sound will be reviewed in detail, with noise control measures provided if necessary.

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.

5.8 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. A recent report released by The Boston Harbor Association, *Preparing for the Rising Tide,* focused on Columbia Point as a case study to demonstrate the need for climate change adaptation strategies. Along with the release of the report, Mayor Menino has announced that his administration will be pursuing new planning and policy initiatives to prepare Boston for major storm events. While not located directly on the shoreline, the proximity of the Site to Boston Harbor and its specific topographical conditions warrant the implementation of measures to protect the Project against flooding.

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 2009 that updated the flood zones for this area. According to FEMA, a portion of the site is in the 100-year flood zone, which is established as Zone AE, Elevation 10.

In March 2013, the Proponent received a Conditional Letter of Map Revision Based on Fill (CLOMR-F) from FEMA reflecting the proposed change in elevation and determining that the site will be lifted entirely out of the 100-year flood zone. The elevation of the site will mean that all habitable spaces and building systems will be above this zone. This will significantly decrease the vulnerability of the site to flooding, decrease potential damage to the property and, most importantly, increase the safety of residents.

In association with the Project, a portion of the Site, which is located in the 100-year flood zone, will be elevated by fill in order to remove it from this area. Currently, the site's base elevation ranges from 8.5 to 10.5 NAVD (15.0 to 17.0 feet BCB). The site will be elevated up to 2 feet so that its base elevation in that portion of the site in the vicinity of the proposed building will range from 10.0 to 11.5 NAVD (16.5 to 18.0 BCB). The entirety of the area on which the new building will be located will be elevated to at least 10.5 NAVD (17.0 BCB), ensuring that the building will be entirely out of the flood plain elevation of 10 NAVD (16.46 BCB). See Figure 5-5, Plan Showing Site Elevation After Fill.

Several aspects of the building's design will assist in alleviating the potential adverse impacts of flooding. The underground garage ramp will start at an elevation higher than the 100-year flood elevation. The main residential entrance will also be located above the 100-year flood elevation. The landscape will slope up towards the different building access points to divert water away from the building and will maximize the use of permeable surfaces to enhance water infiltration.

5.9 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 site;
- Using temporary gravel entrance berms at the main exits from the Site;
- Isolating and protecting stockpiled materials;
- Monitoring the proper use of tarpaulin covered trucks;
- Preventing/controlling truck spillage; and
- Cleaning the adjacent portions of city streets entering and exiting the project.

5.10 GEOTECHNICAL

5.10.1 SUBSURFACE SOIL CONDITIONS

Based on borings conducted at the Site, the existing bituminous concrete surface is underlain by a miscellaneous fill deposit consisting of a loose to dense, brown to black, gravelly sand with some silt, varying to a sand with some gravel and trace silt. The fill was also observed to contain varying amounts of ash, cinders, brick, and glass. The fill deposit was observed to range from 8.5 to 14.5 feet in thickness.

The fill deposit was observed to be underlain by a natural organic deposit, which ranges from about 2 to 6.5 feet in thickness where it is encountered. The organic deposit generally consists of a very soft to soft, dark brown fibrous peat with some organic silt and occasional traces of sand.

Underlying the organic deposit is a marine deposit generally comprised of up to three distinct geologic units: a fine-grained marine silt and clay, a granular marine sand, and a cohesive marine clay. The surface of the marine deposit was encountered at depths of 13.5 to 15.5 feet below the existing ground surface, corresponding to Elevation +1.2 BCB and Elevation +2.3 BCB, respectively. At several boring locations, the upper portion of the marine deposit varies from a marine silt and clay to a marine sand and, where present, extends to as much as 55 to 60 feet below the existing ground surface. The lower portion of the marine deposit typically consists of a cohesive marine clay.

Glacial outwash and glacial till deposits were encountered below the marine clay at depths of 130 to 150 feet below ground surface. The glacial outwash and glacial till are underlain by the bedrock surface.

5.10.2 GROUNDWATER CONDITIONS

The groundwater level recorded in monitoring wells installed in completed boreholes at the site was observed to range from depths of 7.8 to 11.4 feet below the existing ground surface, corresponding to Elevation +7.5 BCB and Elevation +5.7 BCB, respectively.

5.10.3 FOUNDATION DESIGN AND CONSTRUCTION

The proposed structure will be supported on a waterproofed mat foundation bearing on the surface of the natural, inorganic marine deposit. Therefore, removal of the unsuitable fill and compressible organic deposits will require a general site excavation to a depth of approximately 14 to 16 feet below the existing ground surface to construct the single-level below-grade parking garage. The waterproofed mat foundation will be designed to withstand hydrostatic uplift pressures based on a design groundwater level of Elevation +10. Furthermore, the perimeter below-grade foundation walls will also be waterproofed.

To accommodate the construction of the below-grade garage, a temporary excavation support system will be designed and installed around the entire site perimeter to retain adjacent soils, protect adjacent utilities and to provide a temporary groundwater cutoff during construction. The most effective method of achieving temporary excavation support and groundwater control is by means of a continuously interlocking steel sheet pile cofferdam, advanced into the underlying impermeable marine clay deposit.

Given the composition of the fill material, pre-excavation of obstructions along the proposed sheet pile cofferdam alignment will be conducted prior to sheet pile installation. Pre-excavation of obstructions will minimize vibrations related to the installation of the sheeting and limit the potential for sheet pile interlock misalignment which could compromise the effectiveness of the groundwater cut-off. Ground vibrations during sheeting installation are expected to be minimal.

The Project will strive to maintain the groundwater at or near pre-construction levels beyond the site limits in consideration of minimizing potential adverse effects on surrounding utilities, streets and sidewalks. Temporary construction dewatering is generally expected to be minimal due the presence of the sheet pile groundwater cut-off wall.

To confirm the performance of the sheet pile cofferdam, groundwater levels will be monitored before, during, and after construction to document that preconstruction groundwater levels are being maintained. If adverse effects are observed, remedial action, such as groundwater recharge, will be implemented and construction methods adjusted to mitigate any drawdown.

5.11 SOLID AND HAZARDOUS WASTE

The Residences at University Place Site is listed under two Release Tracking Numbers (RTNs) with the Massachusetts Department of Environmental Protection (DEP). The two releases are related to a) the measurement of greater than ½-inch of light non-aqueous phase liquid (separate phase petroleum product or "LNAPL") determined to be No. 6 fuel oil from an unknown source in a single groundwater monitoring well located at the site that triggered a "72-hour reporting condition"; and b) a reportable concentration of total metals and petroleum hydrocarbons in urban fill that triggered a "120-day reporting condition." An Immediate Response Action (IRA) was implemented to address the LNAPL release in accordance with the provision of the Massachusetts Contingency Plan (MCP) 310 CMR 40.0000. The site is currently in regulatory compliance under the MCP for each of the two MCP releases.

Supplemental explorations were conducted at the site to assess the nature and extent of contamination in soil and groundwater. The presence of LNAPL and petroleum hydrocarbon contamination appears to be confined to a localized area of the site and does not appear to migrate off-site. LNAPL and petroleum hydrocarbon contamination will likely be remediated through excavation and if necessary, pumping, treatment and off-site discharge of associated groundwater. Metals contamination appears attributable to the presence of urban fill at the Site. Lead contaminated fill material within a localized portion of the Site exhibited a hazardous concentration of TCLP lead. The TCLP lead affected soil will be treated on-site to stabilize TCLP lead for subsequent excavation and off-site disposal as non-hazardous waste.

Excess excavated soil generated as part of the planned construction will require characterization to assess its disposition for off-site reuse, disposal, treatment or recycling in accordance with DEP policy and the MCP.

The remedial excavations are anticipated to be the primary remedial response action that is likely to result in a Condition of No Significant Risk and that is likely to bring MCP closure to the site as a whole through the filing of a Class A Response Action Outcome (RAO) Statement.

The Proponent will retain a Licensed Site Professional (LSP) to manage the environmental aspects of the project, including proper management and/or disposal of contaminated soil and groundwater encountered during construction. The LSP will also prepare required MCP regulatory submittals.

5.12 CONSTRUCTION IMPACTS

5.12.1 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.

5.12.2 CONSTRUCTION ACTIVITY SCHEDULE

The construction period for the proposed project is expected to last approximately 18 months, beginning in October 2013 and reaching completion by March 2015. 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.

5.12.3 CONSTRUCTION TRAFFIC IMPACTS

Designated truck routes will be established to govern where construction trucks access and egress the site. The primary, regional construction truck access will be via Interstate 93 (I-93). Truck traffic to and from the north and south will use I-93. See Figure 5-6, Construction Truck Routes.

The suggested local truck route to the Site from the North is I-93 south to Exit 15, left on to Columbia Road, around Kosciuszko Circle to William J. Day Boulevard, right along the roadway adjacent to the State Police Headquarters and to the Site. The route from the south on I-93, would be to take Exit 15, right on to Columbia Road, and would then be the same as north route.

The egress route would include exiting onto Mount Vernon Street, passing below the Morrissey Boulevard Ramp, making a U-turn onto Old Colony Avenue, passing around ¼ of Kosciuszko Circle onto Columbia Road and from there to the north or southbound ramps to I-93.

Truck traffic will be heaviest during the excavation and concrete foundation work. During this period, it is expected that fewer than ten trucks, varying in size from small delivery trucks to 18-wheelers, will arrive and leave the site each construction day. Thereafter, truck traffic will vary throughout the construction period, depending upon the activity.

The Project will work closely with the BTD in developing a Construction Management Plan that will include more detail on construction phasing, number of trips, haul routes, and hours of operation.

5.12.4 CONSTRUCTION WORKER PARKING AND STAGING

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; and
- 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 trades people 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.

Construction staging will occur to the east side of the Site between the existing office building and the new building Site. Limited on-site parking will be provided for certain key workers on the Parking Lot Parcel to the north of the Site.

5.12.5 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 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.

5.12.6 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.

5.12.7 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. The 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 Site.
- Erosion controls will be maintained and replaced as necessary until the installation of pavement and the establishment of stabilized vegetation at the Site.

5.12.8 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 Site, including building interiors. During the construction process, regular service visits will be made to maintain effective rodent control levels.

5.13 WILDLIFE HABITAT

The Site is fully developed with urban landscape materials (pavement for the existing parking lot) 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.

5.14 HISTORIC AND ARCHAEOLOGICAL RESOURCES

5.14.1 HISTORIC AND ARCHAEOLOGICAL RESOURCES ON THE PROJECT SITE

The site was used as a cow pasture and a burn dump prior to the 1940s. From the 1940s to the 1960s the site was used as a military prison camp until it was paved to create the parking lot in the 1960s. The site has been a paved parking lot since that time. No historic resources are located on the site and due to the long-term uses described above no archaeological resources are known to exist on the site.

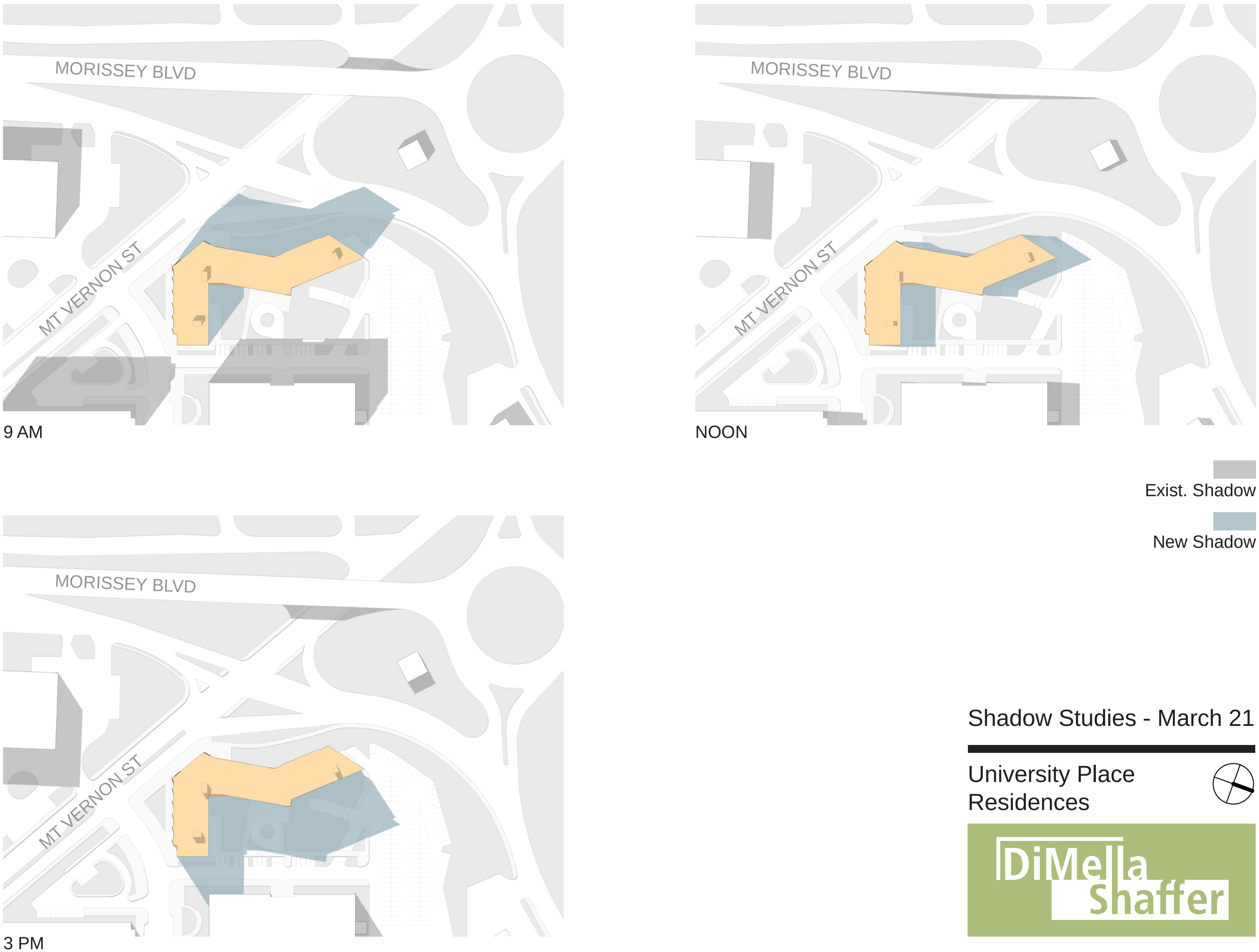
5.14.2 HISTORIC RESOURCES IN THE VICINITY OF THE PROJECT SITE

Historic resources listed on the Massachusetts Inventory of Historic and Archaeological Resources and located in the immediate vicinity of the project, within approximately .25 miles, are identified on Figure 5-7, Historic Resources. St. Christopher's Church and Rectory are south of the site on the opposite side of Mount Vernon Street. The remaining seven properties are part of the Metropolitan Parkway System and include William J. Day Boulevard, Columbia Boulevard (Columbia Road), Old Colony Boulevard (now Morrissey Boulevard), Carson Beach and the Carson Beach Bath and Field House and Moakley Park. William J. Day Boulevard, Columbia Boulevard, and Old Colony (Morrissey) Boulevards are part of the State's historic parkway system. These three parkways have been determined to be eligible for listing on the National Register of Historic Places. No properties in the project vicinity are listed on the National Register or designated as Local Landmarks.

No adverse impacts to the historic resources in the surrounding area will result from the proposed site development. The new building design along Mount Vernon Street will not encroach upon existing DCR property and will provide direct access to the DCR parkland through its front entrance, providing a seamless connector so that residents can walk to Carson Beach and other nearby amenities.

Table 5-2: Historic Resources listed on the Massachusetts Inventory of Historic and Archaeological Resources

R#	Name	Location	Description of Resource	Impact of Project on Resource
BOS. 15221	St. Christopher's Church	255 Mount Vernon Street	A postwar traditional church also known as Columbia Point Church constructed in 1956	None
BOS. 15222	St. Christopher's Rectory	255 Mount Vernon Street	Roman Catholic rectory constructed c. 1956	None
BOS-VE	Old Colony Parkway	Morrissey Boulevard	Metropolitan Park System	None
	William J. Day Boulevard	William J. Day Boulevard	Metropolitan Park System	Minor
BOS 9253	Joe Moakley Park	William J. Day Boulevard	Metropolitan Park System	None
BOS 9254	Carson Beach	William J. Day Boulevard	Metropolitan Park System	None
BOS 7177	Carson Beach Bath and Field House	William J. Day Boulevard	Metropolitan Park System	None
	Kosciuszko Circle	William J. Day Boulevard / Columbia Road	Metropolitan Park System	None
	Columbia Boulevard	Columbia Road	Metropolitan Park Systems	None



University Place Residences
Dorchester, Massachusetts

Figure 5-1
Shadow Studies, March 21
Source: DiMella Shaffer Architects, 2012

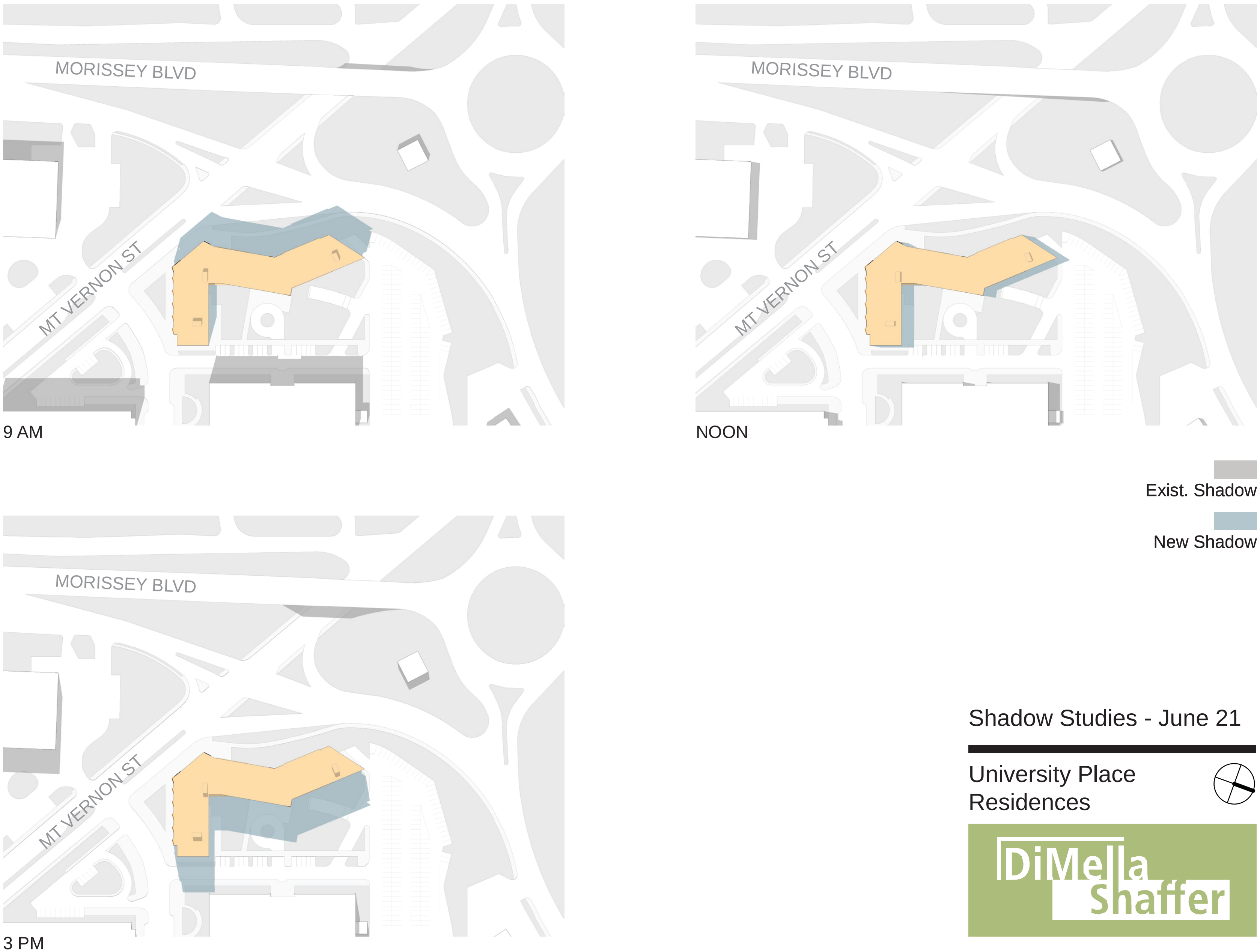


Figure 5-2
Shadow Studies, June 21
Source: DiMella Shaffer Architects, 2012

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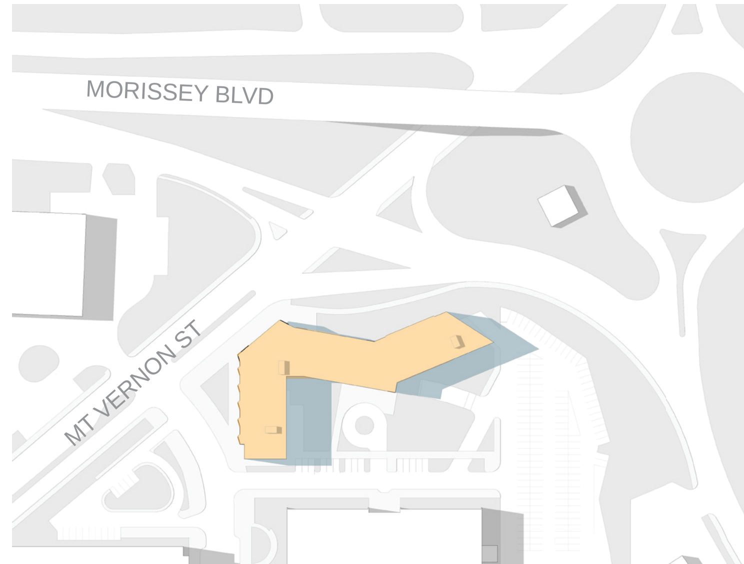

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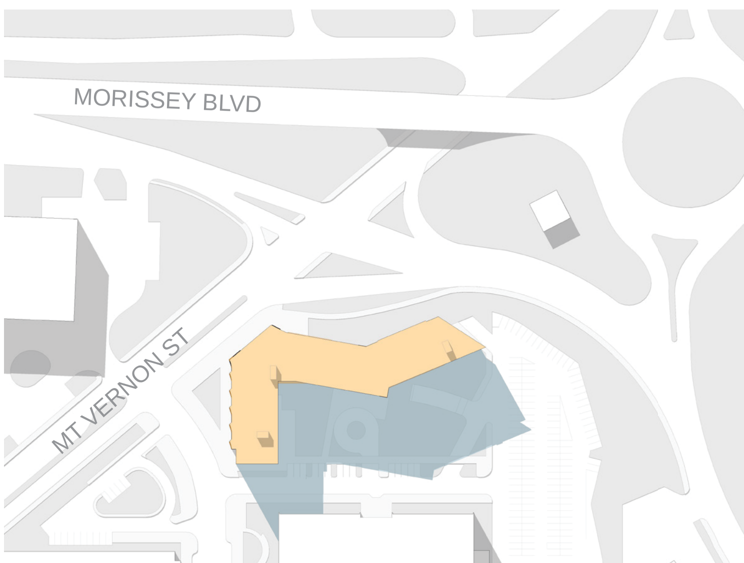

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Shadow Studies - Sept. 21

University Place Residences

DiMella Shaffer

Figure 5-3
Shadow Studies, September 21
Source: DiMella Shaffer Architects, 2012

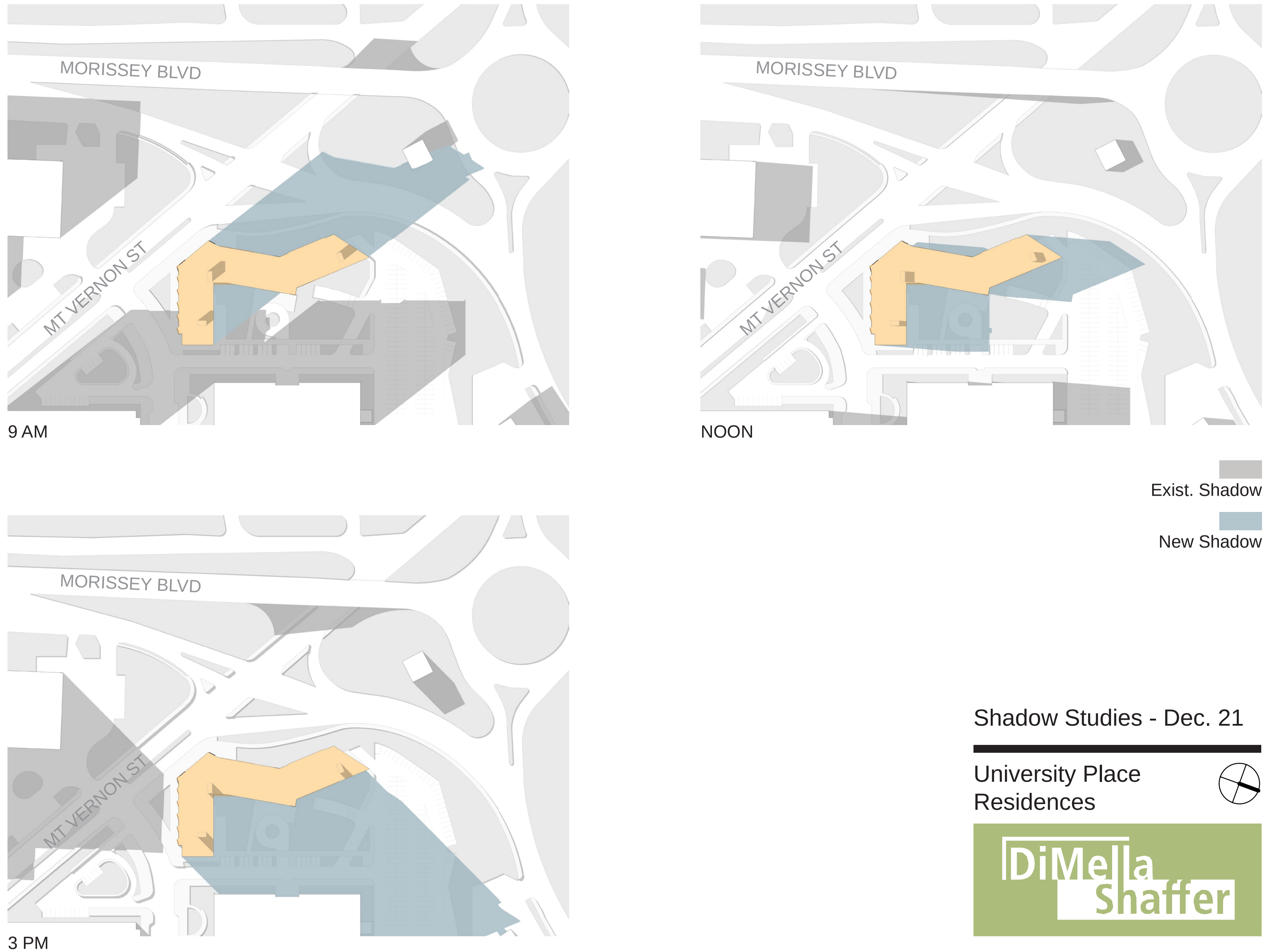


Figure 5-4
Shadow Studies, December 21
Source: DiMella Shaffer Architects, 2012

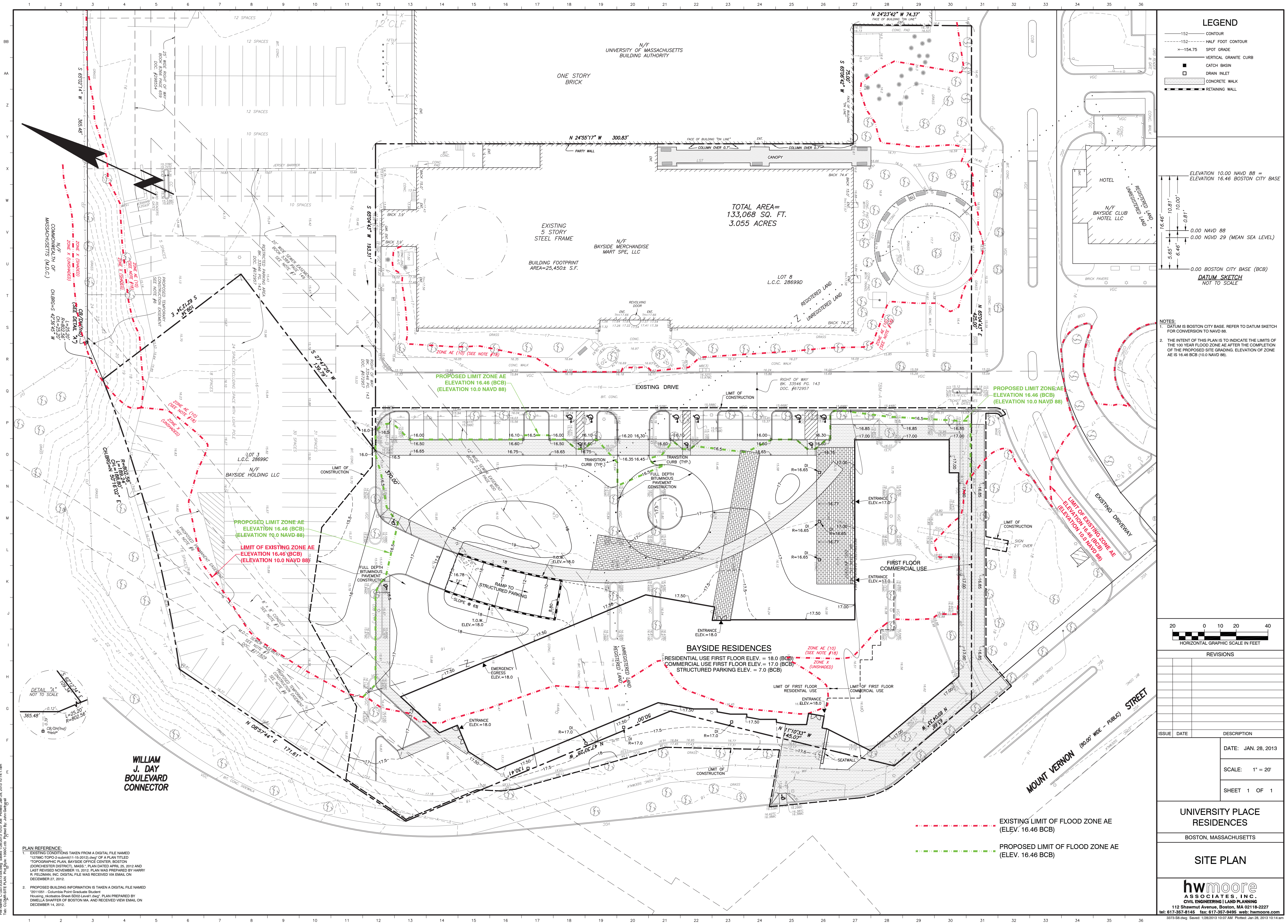
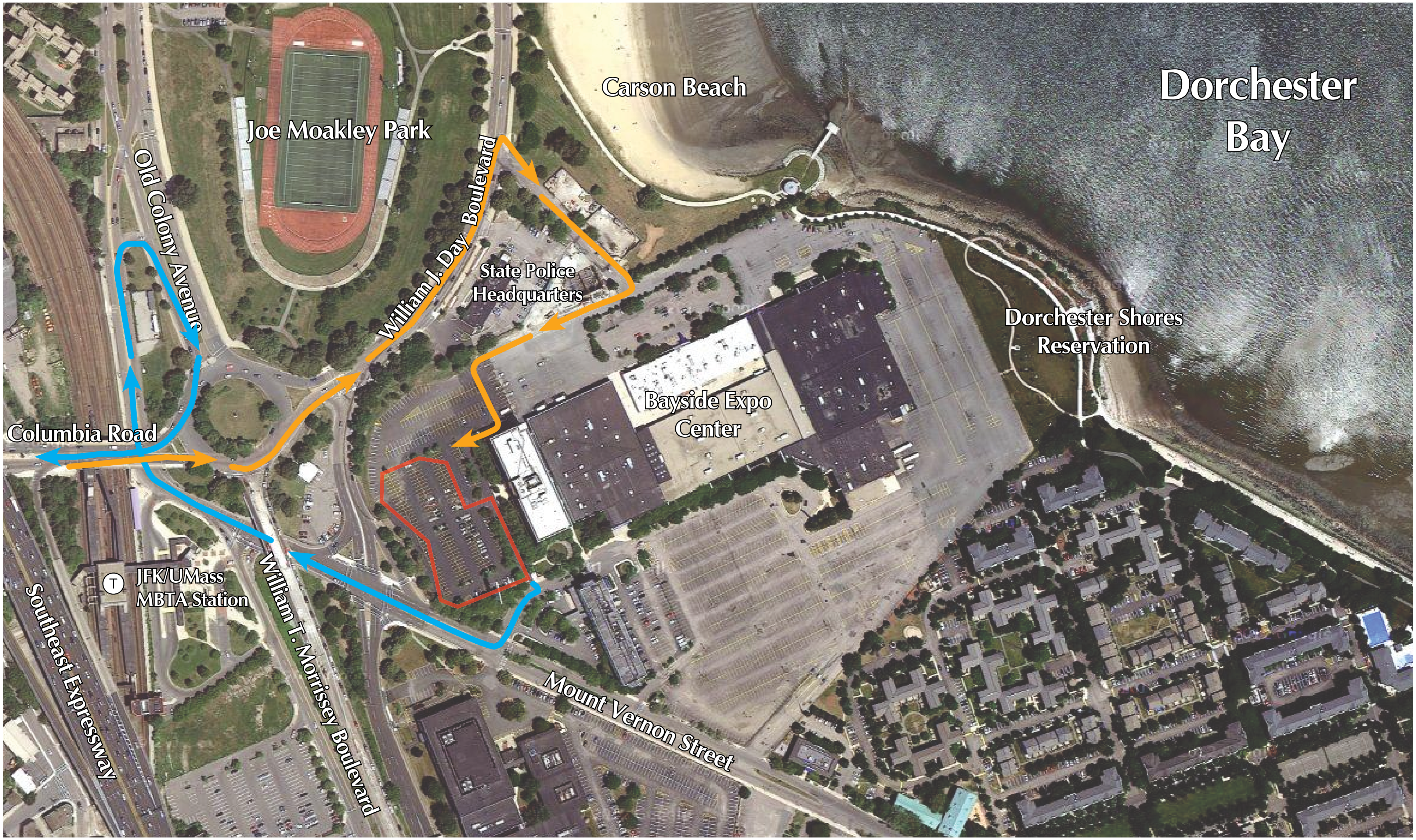


Figure 5-5
Plan Showing Site Elevation After Fill
Source: HW Moore, 2013



University Place Residences
Dorchester, Massachusetts

Figure 5-6
Construction Truck Routes
Source: Google, 2012

Figure 5-7
Historic Resources
Source: MHC, DCR

Chapter 6

INFRASTRUCTURE

CHAPTER 6: INFRASTRUCTURE

The following analysis describes the existing utility systems servicing the project area, discusses the Project's potential impacts on these utilities, and identifies mitigation measures to address potential impacts.

6.1 WASTEWATER

6.1.1 EXISTING SEWER SYSTEM

The Boston Water and Sewer Commission (BWSC) owns and maintains the sewerage system that services the City of Boston. The BWSC sewerage system connects to the Massachusetts Water Resources Authority (MWRA) interceptors for conveyance, treatment, and disposal through the MWRA Deer Island Wastewater Treatment Plant.

There is presently a BWSC 36-inch sewer line in Mount Vernon Street adjacent to the Site. This sewer line flows westerly to a MWRA 116-inch x 87-inch interceptor conduit in Mount Vernon Street at the Day Boulevard access ramps. This interceptor flows northerly along the west side of William J. Day Boulevard to the Columbus Park Headworks. The wastewater is then pumped to the Deer Island Treatment Plant. See Figure 6-1, Drain and Wastewater System Map.

6.1.2 PROJECTED SANITARY SEWER FLOW

The Project will include a single, 6-story building with structured parking on the basement level. The building will include 184 rental apartment units, approximately 10,000 square feet of commercial space on the first level, and structured parking for 76 vehicles.

The sewage flow for the project has been estimated in accordance with 310 CMR 7.15.203: System Sewage Flow Design Criteria and is summarized in Table 6-1, Estimated Sewerage Flow. The total estimated sewage flow for the project is 25,830 gallons per day. The actual wastewater generation will be significantly less than the design flow stated above due to the use of low flow plumbing fixtures.

Table 6-1: Estimated Sewage Flow

Proposed Use	Number of Units	Unit Flow (gpd)	Sewerage flow (gpd)
Residential	228 Bedrooms	110/gpd/bedroom	25,080
Retail	10,000 sf	75 gpd/1000 sf	750
Total Est. Flow			**25,830**

6.1.3 SANITARY SEWER CONNECTION

The proposed Project sewer connection will be a single, 10-inch connection from the building to the existing 36-inch sewer main in Mount Vernon Street. Floor drains in the parking structure will discharge to an oil and grease separator prior to connecting to the building sewer system in accordance with the Massachusetts Plumbing Code.

The sewer connection will comply with Boston Water and Sewer Commission requirements. Any abandoned utilities shall be cut and capped at the main. The sewage flow from any future commercial kitchen will discharge to a grease trap prior to connecting to the building sewer system.

6.2 WATER SYSTEM

6.2.1 EXISTING WATER SYSTEM

BWSC provides water service to the City of Boston through a well developed network of pipes. Water is supplied from the MWRA system.

BWSC has two water mains in Mount Vernon Street. A 1906 12-inch southern low water main runs along the north side of Mount Vernon Street, and a 1954 12-inch southern low water main runs along the south side of Mount Vernon Street. These lines are part of a loop system. BWSC plans to replace the existing 1906 line with a new 16-inch line with the construction of the new line presently scheduled for the spring of 2013. See Figure 6-2, Water Distribution Map.

6.2.2 ANTICIPATED WATER CONSUMPTION

Water consumption for the project has been estimated based on 110% of the average daily estimated sewage flow with the total estimated consumption of 28,413 gallons per day. This includes 27,588 gallons per day for the residential use and 825 gallons per day for the retail use. The actual water usage will be significantly less than the estimated design flow stated above due to the use of water saving devices, which are described below.

6.2.3 PROPOSED WATER SYSTEMS

The proposed building water service will connect either to the existing 12-inch main in the north side of Mount Vernon Street, or to the proposed 16-inch line if it has been constructed within the anticipated time frame. The water service will be metered in accordance with BWSC requirements. Backflow preventer devices will be installed on all fire service where required to protect from cross-connection hazards. Water supply systems servicing the project will be gated so as to minimize public hazard or inconvenience in the event of a water main break. The proponent will also submit a General Service Application and Site Plan to the BWSC for review and approval.

6.2.4 WATER SUPPLY CONSERVATION AND MITIGATION MEASURES

Conserving water, especially potable water, is an important element of the project's sustainable design strategy. The State Building Code requires the use of water conserving fixtures. Water conservation measures such as low-flow water closets, low-flow facet aerators, and restricted flow showerheads will be used to reduce the domestic water demand. These systems will be installed consistent with the code requirements.

Water demands will be further reduced by the implementation Low Impact Development (LID) techniques during the site design phase of the project. These LIDs will include planting of native draught resistant plant and shrubs, limiting irrigation, and using only high efficiency irrigations.

6.3 STORM DRAINAGE SYSTEM

6.3.1 EXISTING STORM DRAIN SYSTEM

The Site is a paved parking lot with a few landscaped islands. The stormwater from the Site presently flows to existing catch basins in the parking area. The stormwater then flows through a closed pipe system to an on-site 24-inch line located in the easterly portion of the Site. The 24-inch line runs northerly into the adjacent parking area where it connects to a MWRA valve chamber that was constructed as part of the new MWRA North Dorchester Bay CS Storage Tunnel system. The valve chamber will direct flow from small storm events to the storage tunnel and the flow from larger storm events to the new BWSC Morrissey Boulevard Conduit.

6.3.2 PROPOSED DRAINAGE CONDITIONS

The proposed stormwater system will comply with DEP's Stormwater Management Regulations. Surface stormwater runoff will flow to catch basins with deep sumps and oil trap hoods and then to a water quality device prior to discharging to a closed pipe system. Roof runoff, which is considered clean water, will flow directly to the closed pipe system.

The proposed drain system will connect to the existing, on-site 24-inch drain line which discharges to the MWRA valve chamber. MWRA has designed the tunnel flushing system based on the existing flow to the tunnel from the 24-inch drain line, and therefore the project will continue to discharge stormwater to this system. There will therefore be no new connection to the BWSC drain systems.

6.3.3 MITIGATION MEASURES

The Project presents an opportunity to substantially improve stormwater management on the Site in a number of ways. The Project will not result in an increase of the peak flow and volume of stormwater from the Site due to the removal of a significant amount of paved area.

The proposed stormwater system will include Stormwater Best Management Practices (BMP) with consideration being given to application of Low Impact Development (LID) techniques to both reduce the quality of runoff and improve water quality. LID minimizes adverse water quality impacts by mimicking the Site's natural hydrologic conditions by infiltrating filtering, detaining and evaporating stormwater runoff close to its source.

The Project will significantly decrease the volume and peak rate of stormwater runoff from the Site due to significant decrease in impervious surfaces. Stormwater runoff from pavement areas will be treated to remove 80% of the total suspended solids prior to discharging to the existing drain system.

A long term Pollution Prevention Plan will be developed for the Project that will identify suitable practices for source control Stormwater Pollution Prevention as outlined in the MASSDEP Stormwater handbook. The long term Pollution Prevention Plan will address source control measures including street sweeping, snow and salt management, fertilizers, herbicides, pesticides stabilization of eroding surfaces and maintenance if the stormwater management systems.

A Stormwater Pollution Prevention Plan (SWPPP) will be developed in conformance with the EPA, NPDES and DEP Guideline. The SWPPP will address sedimentation and erosion controls as well as material management practices, spill control practices during the construction period.

6.4 ELECTRICAL SERVICES

NStar provides electric service in the City of Boston. There are existing electric underground service lines in Mount Vernon Street. All new electric service will be installed underground from Mount Vernon Street. Electric power supply design will be further coordinated with NStar as the project design process and electric consumption is determined.

The Proponent is committing 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, exceeding Boston's Article 37 standards and the requirements of the State Building Code. 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 of Boston and NStar. In addition to giving consideration to efficiency strategies, this planning process will evaluate the potential for meeting a portion of the Site's energy demand through options such as green power purchasing and on-site generation.

6.5 TELCOMMUNICATIONS SYSTEM

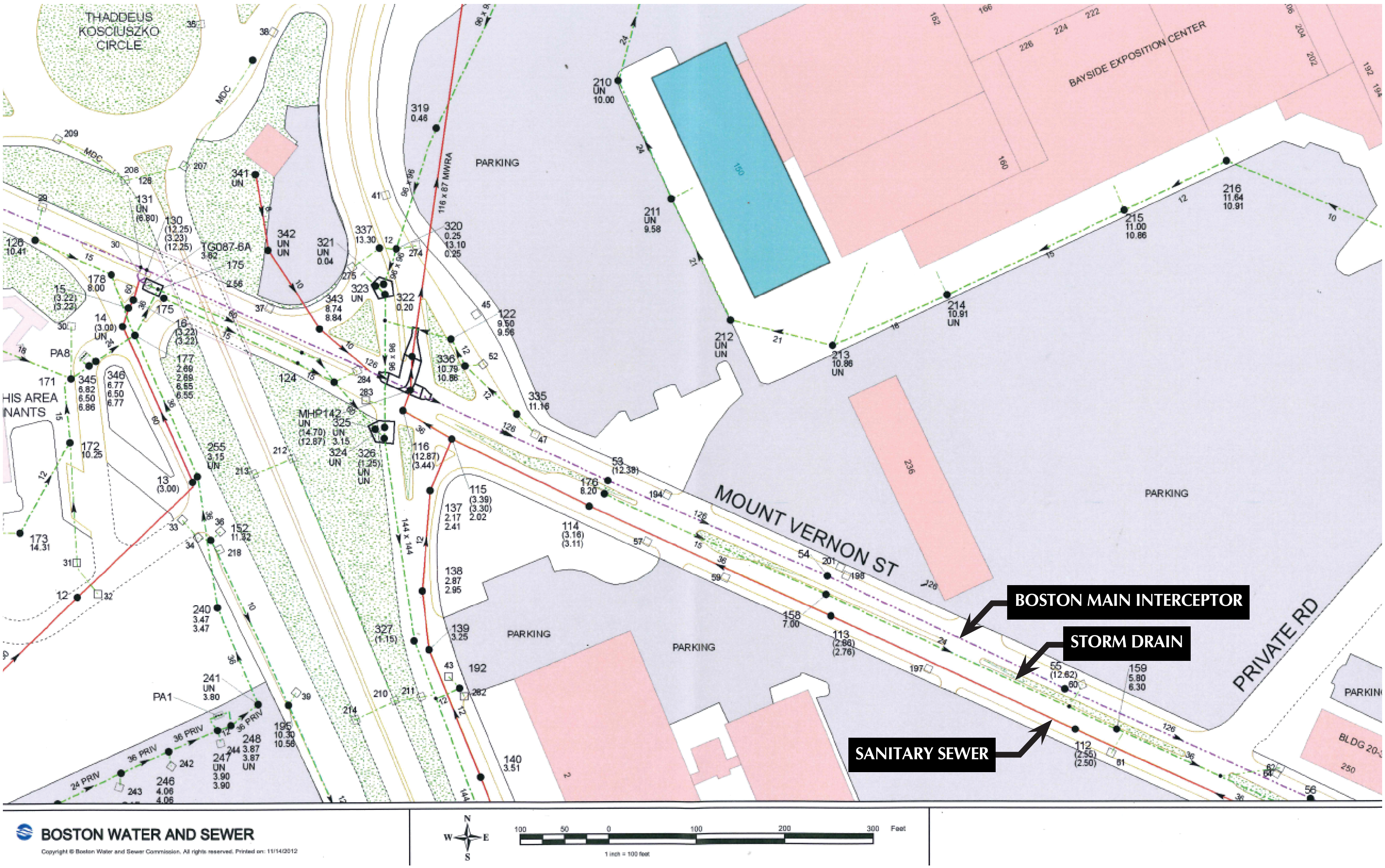
Verizon New England provides telephone service in the Project area. There are underground telephone service lines in Mount Vernon Street. It is anticipated that the new telephone services will be installed underground from Mount Vernon Street. Communication service may also be provided to the development by Comcast.

6.6 NATURAL GAS SYSTEMS

Keyspan Energy delivery provides natural gas service in the project area. There is a 30-inch gas main in Mount Vernon Street. It is anticipated that the new gas services will connect to the main in Mount Vernon Street. As noted above with respect to electricity, the Proponent is committing to taking an integrated and comprehensive approach to energy planning, which will also include working closely with the City of Boston and Key Span with respect to natural gas usage. In addition to adopting energy efficiency strategies, this planning process will evaluate the potential for meeting a portion of the Site's electric and thermal demand through options such as on-site generation.

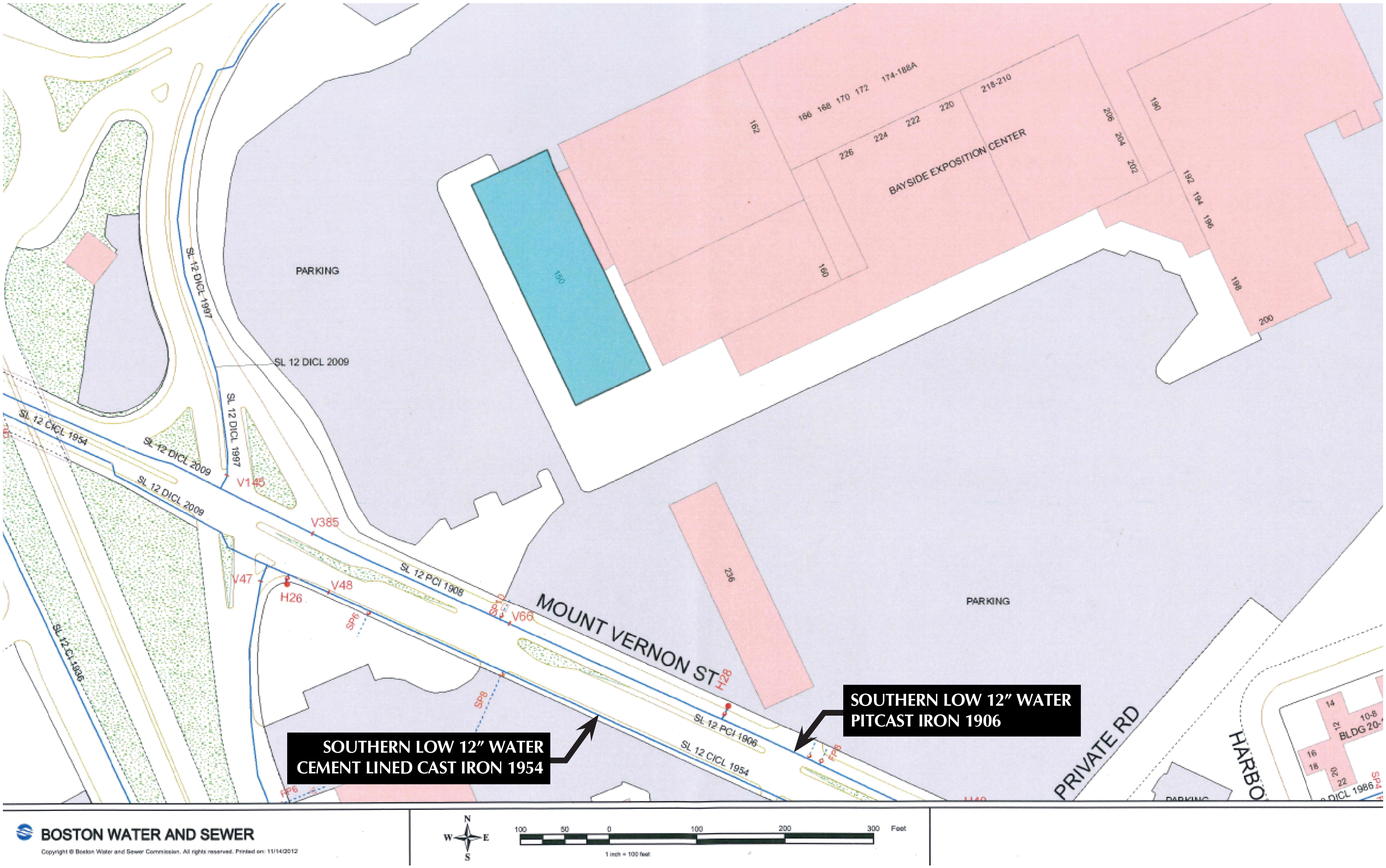
6.7 UTILITY PROTECTION DURING CONSTRUCTION

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



University Place Residences
Dorchester, Massachusetts

Figure 6-1
Drain and Wastewater System Map
Source: Boston Water and Sewer Commission, 2012



University Place Residences
Dorchester, Massachusetts

Figure 6-2
Water Distribution System Map
Source: Boston Water and Sewer Commission, 2012

Appendix A

SYNCHRO REPORTS

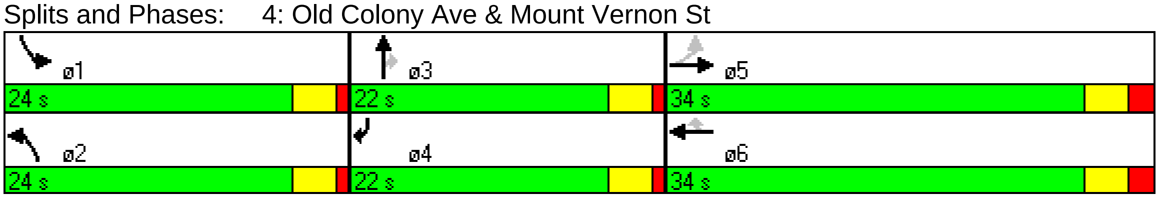
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	9	12	11	16	12	13	15	12	12	16
Storage Length (ft)	0		0	0		60	0		60	0		60
Storage Lanes	0		0	0		1	2		1	2		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50	50		50
Trailing Detector (ft)	0	0			0	0	0	0	0	0		0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt						0.850			0.850			0.850
Flt Protected		0.993					0.950			0.950		
Satd. Flow (prot)	0	2997	0	0	3231	1727	3335	3693	1725	3367	0	1695
Flt Permitted		0.900					0.950			0.950		
Satd. Flow (perm)	0	2716	0	0	3231	1727	3335	3693	1725	3367	0	1695
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						72			59			184
Headway Factor	1.00	1.14	1.14	1.00	1.04	0.85	1.00	0.96	0.88	1.00	1.00	0.85
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		372			350			246			492	
Travel Time (s)		8.5			8.0			5.6			11.2	
Volume (vph)	10	54	0	0	269	54	912	851	119	328	0	213
Peak Hour Factor	0.83	0.79	0.92	0.74	0.74	0.75	0.84	0.90	0.80	0.92	0.25	0.72
Heavy Vehicles (%)	0%	9%	0%	0%	8%	6%	5%	1%	3%	4%	0%	8%
Adj. Flow (vph)	12	68	0	0	364	72	1086	946	149	357	0	296
Lane Group Flow (vph)	0	80	0	0	364	72	1086	946	149	357	0	296
Turn Type	Perm					Perm	Prot		Perm	Prot		custom
Protected Phases		5			6		2	3		1		4
Permitted Phases	5					6			3			
Detector Phases	5	5			6	6	2	3	3	1		4
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0		5.0
Minimum Split (s)	22.0	22.0			22.0	22.0	9.0	18.0	18.0	13.0		21.0
Total Split (s)	34.0	34.0	0.0	0.0	34.0	34.0	24.0	22.0	22.0	24.0	0.0	22.0
Total Split (%)	42.5%	42.5%	0.0%	0.0%	42.5%	42.5%	30.0%	27.5%	27.5%	30.0%	0.0%	27.5%
Maximum Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	1.0	1.0	1.0	1.0		1.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min			C-Min	C-Min	None	None	None	None		None
Walk Time (s)	7.0	7.0			7.0	7.0		7.0	7.0	7.0		7.0
Flash Dont Walk (s)	10.0	10.0			10.0	10.0		7.0	7.0	2.0		10.0
Pedestrian Calls (#/hr)	0	0			0	0		0	0	0		0
Act Effct Green (s)		30.0			30.0	30.0	20.0	18.0	18.0	20.0		18.0
Actuated g/C Ratio		0.38			0.38	0.38	0.25	0.22	0.22	0.25		0.22
v/c Ratio		0.08			0.30	0.10	1.30	1.14	0.34	0.42		0.56
Control Delay		16.5			18.5	4.9	173.2	107.7	18.5	27.0		15.4
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		16.5			18.5	4.9	173.2	107.7	18.5	27.0		15.4
LOS		B			B	A	F	F	B	C		B
Approach Delay		16.5			16.2			134.2				
Approach LOS		B			B			F				
90th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
90th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Max
70th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
70th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
50th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
50th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
30th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
30th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
10th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
10th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
Queue Length 50th (ft)		13			65	0	~364	~294	37	77		47
Queue Length 95th (ft)		23			78	17	#436	#412	72	115		72
Internal Link Dist (ft)		292			270			166			412	
Turn Bay Length (ft)						60			60			60
Base Capacity (vph)		1019			1212	693	834	831	434	842		524
Starvation Cap Reductn		0			0	0	0	0	0	0		0
Spillback Cap Reductn		0			0	0	0	0	0	0		0
Storage Cap Reductn		0			0	0	0	0	0	0		0
Reduced v/c Ratio		0.08			0.30	0.10	1.30	1.14	0.34	0.42		0.56

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 64 (80%), Referenced to phase 5:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.30
Intersection Signal Delay: 94.1 Intersection LOS: F
Intersection Capacity Utilization 56.6% ICU Level of Service B
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Old Colony Ave & Mount Vernon St



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	378	338	217	306	11	899
Peak Hour Factor	0.79	0.93	0.78	0.89	0.69	0.92
Hourly flow rate (vph)	478	363	278	344	16	977
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					Raised	
Median storage veh)					0	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			842		1389	421
vC1, stage 1 conf vol					660	
vC2, stage 2 conf vol					728	
vCu, unblocked vol			842		1389	421
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			65		89	0
cM capacity (veh/h)			789		150	584

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	319	523	393	229	342	651
Volume Left	0	0	278	0	16	0
Volume Right	0	363	0	0	326	651
cSH	1700	1700	789	1700	514	584
Volume to Capacity	0.19	0.31	0.35	0.13	0.66	1.12
Queue Length 95th (ft)	0	0	40	0	121	510
Control Delay (s)	0.0	0.0	9.8	0.0	24.8	98.6
Lane LOS			A		C	F
Approach Delay (s)	0.0		6.2		73.2	
Approach LOS					F	

Intersection Summary			
Average Delay	31.1		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	42	277	182	3	251	24	29	9	7	7	6	43
Peak Hour Factor	0.58	0.93	0.88	0.38	0.92	0.60	0.81	0.56	0.44	0.88	0.30	0.67
Hourly flow rate (vph)	72	298	207	8	273	40	36	16	16	8	20	64
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		350										
pX, platoon unblocked												
vC, conflicting volume	313			505			772	875	252	626	958	156
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	313			505			772	875	252	626	958	156
tC, single (s)	4.1			4.1			7.7	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			84	94	98	98	92	92
cM capacity (veh/h)	1259			1070			227	271	753	331	243	852

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	72	199	306	144	176	68	92
Volume Left	72	0	0	8	0	36	8
Volume Right	0	0	207	0	40	16	64
cSH	1259	1700	1700	1070	1700	284	507
Volume to Capacity	0.06	0.12	0.18	0.01	0.10	0.24	0.18
Queue Length 95th (ft)	5	0	0	1	0	23	16
Control Delay (s)	8.0	0.0	0.0	0.5	0.0	21.6	13.7
Lane LOS	A			A		C	B
Approach Delay (s)	1.0			0.2		21.6	13.7
Approach LOS						C	B

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	9	12	11	16	12	13	15	12	12	16
Storage Length (ft)	0		0	0		60	0		60	0		60
Storage Lanes	0		0	0		1	2		1	2		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50	50		50
Trailing Detector (ft)	0	0			0	0	0	0	0	0		0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt						0.850			0.850			0.850
Flt Protected		0.992					0.950			0.950		
Satd. Flow (prot)	0	2839	0	0	3144	1695	3213	3730	1725	3127	0	1777
Flt Permitted		0.851					0.950			0.950		
Satd. Flow (perm)	0	2435	0	0	3144	1695	3213	3730	1725	3127	0	1777
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						81			120			138
Headway Factor	1.00	1.14	1.14	1.00	1.04	0.85	1.00	0.96	0.88	1.00	1.00	0.85
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		372			350			246			492	
Travel Time (s)		8.5			8.0			5.6			11.2	
Volume (vph)	20	114	0	0	415	85	251	256	98	239	0	350
Peak Hour Factor	0.71	0.74	0.25	0.25	0.83	0.89	0.77	0.81	0.82	0.85	0.25	0.89
Heavy Vehicles (%)	0%	16%	0%	0%	11%	8%	9%	0%	3%	12%	0%	3%
Adj. Flow (vph)	28	154	0	0	500	96	326	316	120	281	0	393
Lane Group Flow (vph)	0	182	0	0	500	96	326	316	120	281	0	393
Turn Type	Perm					Perm	Prot		Perm	Prot		custom
Protected Phases		5			6		2	3		1		4
Permitted Phases	5					6			3			
Detector Phases	5	5			6	6	2	3	3	1		4
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0		5.0
Minimum Split (s)	22.0	22.0			22.0	22.0	9.0	21.0	21.0	13.0		21.0
Total Split (s)	29.0	29.0	0.0	0.0	29.0	29.0	21.0	30.0	30.0	21.0	0.0	30.0
Total Split (%)	36.3%	36.3%	0.0%	0.0%	36.3%	36.3%	26.3%	37.5%	37.5%	26.3%	0.0%	37.5%
Maximum Green (s)	24.0	24.0			24.0	24.0	17.0	26.0	26.0	17.0		26.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	1.0	1.0	1.0	1.0		1.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min			C-Min	C-Min	None	None	None	None		None
Walk Time (s)	7.0	7.0			7.0	7.0		7.0	7.0	7.0		7.0
Flash Dont Walk (s)	10.0	10.0			10.0	10.0		7.0	7.0	2.0		10.0
Pedestrian Calls (#/hr)	0	0			0	0		0	0	0		0
Act Effct Green (s)		38.0			38.0	38.0	13.1	16.9	16.9	13.1		16.9
Actuated g/C Ratio		0.48			0.48	0.48	0.16	0.21	0.21	0.16		0.21
v/c Ratio		0.16			0.34	0.11	0.62	0.40	0.26	0.55		0.81
Control Delay		15.1			16.0	6.1	36.1	27.4	6.0	34.5		31.9
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		15.1			16.0	6.1	36.1	27.4	6.0	34.5		31.9
LOS		B			B	A	D	C	A	C		C
Approach Delay		15.1			14.4			27.8				
Approach LOS		B			B			C				
90th %ile Green (s)	24.8	24.8			24.8	24.8	17.0	25.2	25.2	17.0		25.2
90th %ile Term Code	Coord	Coord			Coord	Coord	Max	Hold	Hold	Hold		Gap
70th %ile Green (s)	32.3	32.3			32.3	32.3	14.5	20.2	20.2	14.5		20.2
70th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Hold		Gap
50th %ile Green (s)	37.1	37.1			37.1	37.1	13.1	16.8	16.8	13.1		16.8
50th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Hold		Gap
30th %ile Green (s)	42.0	42.0			42.0	42.0	11.5	13.5	13.5	11.5		13.5
30th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Hold		Gap
10th %ile Green (s)	48.6	48.6			48.6	48.6	9.4	9.0	9.0	9.4		9.0
10th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Hold		Gap
Queue Length 50th (ft)		25			77	4	78	72	0	67		123
Queue Length 95th (ft)		47			136	36	94	83	28	92		191
Internal Link Dist (ft)		292			270			166			412	
Turn Bay Length (ft)						60			60			60
Base Capacity (vph)		1156			1492	847	683	1212	642	664		671
Starvation Cap Reductn		0			0	0	0	0	0	0		0
Spillback Cap Reductn		0			0	0	0	0	0	0		0
Storage Cap Reductn		0			0	0	0	0	0	0		0
Reduced v/c Ratio		0.16			0.34	0.11	0.48	0.26	0.19	0.42		0.59

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 67 (84%), Referenced to phase 5:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 24.7 Intersection LOS: C
Intersection Capacity Utilization 50.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Old Colony Ave & Mount Vernon St

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	368	223	347	636	3	358
Peak Hour Factor	0.93	0.84	0.79	0.91	0.38	0.89
Hourly flow rate (vph)	396	265	439	699	8	402
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					Raised	
Median storage veh)					0	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			661		1756	331
vC1, stage 1 conf vol					528	
vC2, stage 2 conf vol					1228	
vCu, unblocked vol			661		1756	331
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			52		90	40
cM capacity (veh/h)			923		78	665

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	264	397	672	466	142	268
Volume Left	0	0	439	0	8	0
Volume Right	0	265	0	0	134	268
cSH	1700	1700	923	1700	470	665
Volume to Capacity	0.16	0.23	0.48	0.27	0.30	0.40
Queue Length 95th (ft)	0	0	65	0	32	49
Control Delay (s)	0.0	0.0	10.5	0.0	16.0	14.0
Lane LOS			B		C	B
Approach Delay (s)	0.0		6.2		14.7	
Approach LOS					B	

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	28	394	29	1	356	9	100	0	44	10	1	44
Peak Hour Factor	0.70	0.80	0.81	0.25	0.91	0.56	0.71	0.25	0.79	0.63	0.25	0.79
Hourly flow rate (vph)	40	492	36	4	391	16	141	0	56	16	4	56
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		350										
pX, platoon unblocked												
vC, conflicting volume	407			528			852	1006	264	789	1016	204
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	407			528			852	1006	264	789	1016	204
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	8.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	5.0	3.3
p0 queue free %	96			100			37	100	92	94	97	93
cM capacity (veh/h)	1127			1049			224	234	740	255	117	800

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	40	328	200	200	212	197	76
Volume Left	40	0	0	4	0	141	16
Volume Right	0	0	36	0	16	56	56
cSH	1127	1700	1700	1049	1700	279	456
Volume to Capacity	0.04	0.19	0.12	0.00	0.12	0.70	0.17
Queue Length 95th (ft)	3	0	0	0	0	121	15
Control Delay (s)	8.3	0.0	0.0	0.2	0.0	43.6	14.5
Lane LOS	A			A		E	B
Approach Delay (s)	0.6			0.1		43.6	14.5
Approach LOS						E	B

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	9	12	11	16	12	13	15	12	12	16
Storage Length (ft)	0		0	0		60	0		60	0		60
Storage Lanes	0		0	0		1	2		1	2		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50	50		50
Trailing Detector (ft)	0	0			0	0	0	0	0	0		0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt						0.850			0.850			0.850
Flt Protected		0.993					0.950			0.950		
Satd. Flow (prot)	0	2997	0	0	3231	1727	3335	3693	1725	3367	0	1695
Flt Permitted		0.899					0.950			0.950		
Satd. Flow (perm)	0	2713	0	0	3231	1727	3335	3693	1725	3367	0	1695
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						73			59			178
Headway Factor	1.00	1.14	1.14	1.00	1.04	0.85	1.00	0.96	0.88	1.00	1.00	0.85
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		372			350			246			492	
Travel Time (s)		8.5			8.0			5.6			11.2	
Volume (vph)	10	54	0	0	276	55	935	872	122	336	0	218
Peak Hour Factor	0.83	0.79	0.92	0.74	0.74	0.75	0.84	0.90	0.80	0.92	0.25	0.72
Heavy Vehicles (%)	0%	9%	0%	0%	8%	6%	5%	1%	3%	4%	0%	8%
Adj. Flow (vph)	12	68	0	0	373	73	1113	969	152	365	0	303
Lane Group Flow (vph)	0	80	0	0	373	73	1113	969	152	365	0	303
Turn Type	Perm					Perm	Prot		Perm	Prot		custom
Protected Phases		5			6		2	3		1		4
Permitted Phases	5					6			3			
Detector Phases	5	5			6	6	2	3	3	1		4
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0		4.0
Minimum Split (s)	22.0	22.0			22.0	22.0	9.0	18.0	18.0	13.0		21.0
Total Split (s)	34.0	34.0	0.0	0.0	34.0	34.0	24.0	22.0	22.0	24.0	0.0	22.0
Total Split (%)	42.5%	42.5%	0.0%	0.0%	42.5%	42.5%	30.0%	27.5%	27.5%	30.0%	0.0%	27.5%
Maximum Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	1.0	1.0	1.0	1.0		1.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min			C-Min	C-Min	None	None	None	None		None
Walk Time (s)	7.0	7.0			7.0	7.0		7.0	7.0	7.0		7.0
Flash Dont Walk (s)	10.0	10.0			10.0	10.0		7.0	7.0	2.0		10.0
Pedestrian Calls (#/hr)	0	0			0	0		0	0	0		0
Act Effct Green (s)		30.0			30.0	30.0	20.0	18.0	18.0	20.0		18.0
Actuated g/C Ratio		0.38			0.38	0.38	0.25	0.22	0.22	0.25		0.22
v/c Ratio		0.08			0.31	0.11	1.33	1.17	0.35	0.43		0.58
Control Delay		16.5			18.6	4.9	186.8	118.3	18.8	27.2		16.6
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		16.5			18.6	4.9	186.8	118.3	18.8	27.2		16.6
LOS		B			B	A	F	F	B	C		B
Approach Delay		16.5			16.3			145.7				
Approach LOS		B			B			F				
90th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
90th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Max
70th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
70th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
50th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
50th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
30th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
30th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
10th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
10th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
Queue Length 50th (ft)		13			67	0	~378	~307	38	79		53
Queue Length 95th (ft)		23			80	16	#450	#426	74	118		78
Internal Link Dist (ft)		292			270			166			412	
Turn Bay Length (ft)						60			60			60
Base Capacity (vph)		1017			1212	693	834	831	434	842		519
Starvation Cap Reductn		0			0	0	0	0	0	0		0
Spillback Cap Reductn		0			0	0	0	0	0	0		0
Storage Cap Reductn		0			0	0	0	0	0	0		0
Reduced v/c Ratio		0.08			0.31	0.11	1.33	1.17	0.35	0.43		0.58

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 64 (80%), Referenced to phase 5:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.33
Intersection Signal Delay: 101.8 Intersection LOS: F
Intersection Capacity Utilization 57.8% ICU Level of Service B
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Old Colony Ave & Mount Vernon St

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	388	347	222	314	11	922
Peak Hour Factor	0.79	0.93	0.78	0.89	0.69	0.92
Hourly flow rate (vph)	491	373	285	353	16	1002
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					Raised	
Median storage veh)					0	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			864		1423	432
vC1, stage 1 conf vol					678	
vC2, stage 2 conf vol					746	
vCu, unblocked vol			864		1423	432
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			63		89	0
cM capacity (veh/h)			774		143	574

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	327	537	402	235	350	668
Volume Left	0	0	285	0	16	0
Volume Right	0	373	0	0	334	668
cSH	1700	1700	774	1700	505	574
Volume to Capacity	0.19	0.32	0.37	0.14	0.69	1.16
Queue Length 95th (ft)	0	0	42	0	133	569
Control Delay (s)	0.0	0.0	10.1	0.0	26.7	116.1
Lane LOS			B		D	F
Approach Delay (s)	0.0		6.4		85.3	
Approach LOS					F	

Intersection Summary			
Average Delay	36.1		
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	43	284	187	3	257	25	30	9	11	7	6	44
Peak Hour Factor	0.58	0.93	0.88	0.38	0.92	0.60	0.81	0.56	0.44	0.88	0.30	0.67
Hourly flow rate (vph)	74	305	212	8	279	42	37	16	25	8	20	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		350										
pX, platoon unblocked												
vC, conflicting volume	321			518			791	897	259	650	982	161
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	321			518			791	897	259	650	982	161
tC, single (s)	4.1			4.1			7.7	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			83	94	97	97	91	92
cM capacity (veh/h)	1250			1058			218	263	746	313	234	847

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	74	204	314	148	181	78	94
Volume Left	74	0	0	8	0	37	8
Volume Right	0	0	212	0	42	25	66
cSH	1250	1700	1700	1058	1700	296	497
Volume to Capacity	0.06	0.12	0.18	0.01	0.11	0.26	0.19
Queue Length 95th (ft)	5	0	0	1	0	26	17
Control Delay (s)	8.1	0.0	0.0	0.5	0.0	21.5	13.9
Lane LOS	A			A		C	B
Approach Delay (s)	1.0			0.2		21.5	13.9
Approach LOS						C	B

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	9	12	11	16	12	13	15	12	12	16
Storage Length (ft)	0		0	0		60	0		60	0		60
Storage Lanes	0		0	0		1	2		1	2		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50	50		50
Trailing Detector (ft)	0	0			0	0	0	0	0	0		0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt						0.850			0.850			0.850
Flt Protected		0.992					0.950			0.950		
Satd. Flow (prot)	0	2841	0	0	3144	1695	3213	3730	1725	3127	0	1777
Flt Permitted		0.844					0.950			0.950		
Satd. Flow (perm)	0	2417	0	0	3144	1695	3213	3730	1725	3127	0	1777
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						81			122			131
Headway Factor	1.00	1.14	1.14	1.00	1.04	0.85	1.00	0.96	0.88	1.00	1.00	0.85
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		372			350			246			492	
Travel Time (s)		8.5			8.0			5.6			11.2	
Volume (vph)	21	117	0	0	425	87	257	262	100	245	0	405
Peak Hour Factor	0.71	0.74	0.25	0.25	0.83	0.89	0.77	0.81	0.82	0.85	0.25	0.89
Heavy Vehicles (%)	0%	16%	0%	0%	11%	8%	9%	0%	3%	12%	0%	3%
Adj. Flow (vph)	30	158	0	0	512	98	334	323	122	288	0	455
Lane Group Flow (vph)	0	188	0	0	512	98	334	323	122	288	0	455
Turn Type	Perm					Perm	Prot		Perm	Prot		custom
Protected Phases		5			6		2	3		1		4
Permitted Phases	5					6			3			
Detector Phases	5	5			6	6	2	3	3	1		4
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0		4.0
Minimum Split (s)	22.0	22.0			22.0	22.0	9.0	21.0	21.0	13.0		21.0
Total Split (s)	29.0	29.0	0.0	0.0	29.0	29.0	21.0	30.0	30.0	21.0	0.0	30.0
Total Split (%)	36.3%	36.3%	0.0%	0.0%	36.3%	36.3%	26.3%	37.5%	37.5%	26.3%	0.0%	37.5%
Maximum Green (s)	24.0	24.0			24.0	24.0	17.0	26.0	26.0	17.0		26.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	1.0	1.0	1.0	1.0		1.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min			C-Min	C-Min	None	None	None	None		None
Walk Time (s)	7.0	7.0			7.0	7.0		7.0	7.0	7.0		7.0
Flash Dont Walk (s)	10.0	10.0			10.0	10.0		7.0	7.0	2.0		10.0
Pedestrian Calls (#/hr)	0	0			0	0		0	0	0		0
Act Effct Green (s)		35.3			35.3	35.3	13.2	19.5	19.5	13.2		19.5
Actuated g/C Ratio		0.44			0.44	0.44	0.16	0.24	0.24	0.16		0.24
v/c Ratio		0.18			0.37	0.12	0.63	0.35	0.24	0.56		0.85
Control Delay		16.7			17.9	6.7	36.4	25.0	5.4	34.6		35.6
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		16.7			17.9	6.7	36.4	25.0	5.4	34.6		35.6
LOS		B			B	A	D	C	A	C		D
Approach Delay		16.7			16.1			26.8				
Approach LOS		B			B			C				
90th %ile Green (s)	24.0	24.0			24.0	24.0	17.0	26.0	26.0	17.0		26.0
90th %ile Term Code	Coord	Coord			Coord	Coord	Max	Hold	Hold	Hold		Max
70th %ile Green (s)	28.8	28.8			28.8	28.8	14.7	23.5	23.5	14.7		23.5
70th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Hold		Gap
50th %ile Green (s)	33.9	33.9			33.9	33.9	13.0	20.1	20.1	13.0		20.1
50th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Hold		Gap
30th %ile Green (s)	38.8	38.8			38.8	38.8	11.7	16.5	16.5	11.7		16.5
30th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Hold		Gap
10th %ile Green (s)	46.0	46.0			46.0	46.0	9.5	11.5	11.5	9.5		11.5
10th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Hold		Gap
Queue Length 50th (ft)		28			87	5	81	69	0	69		156
Queue Length 95th (ft)		50			141	37	96	83	27	94		238
Internal Link Dist (ft)		292			270			166			412	
Turn Bay Length (ft)						60			60			60
Base Capacity (vph)		1066			1387	793	683	1212	643	664		666
Starvation Cap Reductn		0			0	0	0	0	0	0		0
Spillback Cap Reductn		0			0	0	0	0	0	0		0
Storage Cap Reductn		0			0	0	0	0	0	0		0
Reduced v/c Ratio		0.18			0.37	0.12	0.49	0.27	0.19	0.43		0.68

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 67 (84%), Referenced to phase 5:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 25.9 Intersection LOS: C
Intersection Capacity Utilization 54.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Old Colony Ave & Mount Vernon St

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	377	229	356	652	3	367
Peak Hour Factor	0.93	0.84	0.79	0.91	0.38	0.89
Hourly flow rate (vph)	405	273	451	716	8	412
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					Raised	
Median storage veh)					0	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			678		1801	339
vC1, stage 1 conf vol					542	
vC2, stage 2 conf vol					1260	
vCu, unblocked vol			678		1801	339
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			50		89	37
cM capacity (veh/h)			910		73	657

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	270	408	689	478	145	275
Volume Left	0	0	451	0	8	0
Volume Right	0	273	0	0	137	275
cSH	1700	1700	910	1700	458	657
Volume to Capacity	0.16	0.24	0.50	0.28	0.32	0.42
Queue Length 95th (ft)	0	0	70	0	34	52
Control Delay (s)	0.0	0.0	10.9	0.0	16.5	14.4
Lane LOS			B		C	B
Approach Delay (s)	0.0		6.4		15.1	
Approach LOS					C	

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	29	404	30	1	365	9	103	0	45	10	1	45
Peak Hour Factor	0.70	0.80	0.81	0.25	0.91	0.56	0.71	0.25	0.79	0.63	0.25	0.79
Hourly flow rate (vph)	41	505	37	4	401	16	145	0	57	16	4	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		350										
pX, platoon unblocked												
vC, conflicting volume	417			542			874	1032	271	809	1042	209
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	417			542			874	1032	271	809	1042	209
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	8.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	5.0	3.3
p0 queue free %	96			100			32	100	92	94	96	93
cM capacity (veh/h)	1117			1037			215	225	733	246	112	794

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	41	337	205	205	217	202	77
Volume Left	41	0	0	4	0	145	16
Volume Right	0	0	37	0	16	57	57
cSH	1117	1700	1700	1037	1700	268	446
Volume to Capacity	0.04	0.20	0.12	0.00	0.13	0.75	0.17
Queue Length 95th (ft)	3	0	0	0	0	137	15
Control Delay (s)	8.3	0.0	0.0	0.2	0.0	50.2	14.7
Lane LOS	A			A		F	B
Approach Delay (s)	0.6			0.1		50.2	14.7
Approach LOS						F	B

Intersection Summary			
Average Delay	9.1		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	9	12	11	16	12	13	15	12	12	16
Storage Length (ft)	0		0	0		60	0		60	0		60
Storage Lanes	0		0	0		1	2		1	2		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50	50		50
Trailing Detector (ft)	0	0			0	0	0	0	0	0		0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt						0.850			0.850			0.850
Flt Protected		0.993					0.950			0.950		
Satd. Flow (prot)	0	2995	0	0	3231	1727	3335	3693	1725	3367	0	1695
Flt Permitted		0.901					0.950			0.950		
Satd. Flow (perm)	0	2718	0	0	3231	1727	3335	3693	1725	3367	0	1695
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						73			60			178
Headway Factor	1.00	1.14	1.14	1.00	1.04	0.85	1.00	0.96	0.88	1.00	1.00	0.85
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		372			350			246			492	
Travel Time (s)		8.5			8.0			5.6			11.2	
Volume (vph)	10	57	0	0	276	55	935	872	123	346	0	218
Peak Hour Factor	0.83	0.79	0.92	0.74	0.74	0.75	0.84	0.90	0.80	0.92	0.25	0.72
Heavy Vehicles (%)	0%	9%	0%	0%	8%	6%	5%	1%	3%	4%	0%	8%
Adj. Flow (vph)	12	72	0	0	373	73	1113	969	154	376	0	303
Lane Group Flow (vph)	0	84	0	0	373	73	1113	969	154	376	0	303
Turn Type	Perm					Perm	Prot		Perm	Prot		custom
Protected Phases		5			6		2	3		1		4
Permitted Phases	5					6			3			
Detector Phases	5	5			6	6	2	3	3	1		4
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0		4.0
Minimum Split (s)	22.0	22.0			22.0	22.0	9.0	18.0	18.0	13.0		21.0
Total Split (s)	34.0	34.0	0.0	0.0	34.0	34.0	24.0	22.0	22.0	24.0	0.0	22.0
Total Split (%)	42.5%	42.5%	0.0%	0.0%	42.5%	42.5%	30.0%	27.5%	27.5%	30.0%	0.0%	27.5%
Maximum Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	1.0	1.0	1.0	1.0		1.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min			C-Min	C-Min	None	None	None	None		None
Walk Time (s)	7.0	7.0			7.0	7.0		7.0	7.0	7.0		7.0
Flash Dont Walk (s)	10.0	10.0			10.0	10.0		7.0	7.0	2.0		10.0
Pedestrian Calls (#/hr)	0	0			0	0		0	0	0		0
Act Effct Green (s)		30.0			30.0	30.0	20.0	18.0	18.0	20.0		18.0
Actuated g/C Ratio		0.38			0.38	0.38	0.25	0.22	0.22	0.25		0.22
v/c Ratio		0.08			0.31	0.11	1.33	1.17	0.35	0.45		0.58
Control Delay		16.5			18.6	4.9	186.8	118.3	18.8	27.4		16.6
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		16.5			18.6	4.9	186.8	118.3	18.8	27.4		16.6
LOS		B			B	A	F	F	B	C		B
Approach Delay		16.5			16.3			145.6				
Approach LOS		B			B			F				
90th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
90th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Max
70th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
70th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
50th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
50th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
30th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
30th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
10th %ile Green (s)	29.0	29.0			29.0	29.0	20.0	18.0	18.0	20.0		18.0
10th %ile Term Code	Coord	Coord			Coord	Coord	Max	Max	Max	Hold		Hold
Queue Length 50th (ft)		13			67	0	~378	~307	39	81		53
Queue Length 95th (ft)		24			80	16	#450	#426	75	122		78
Internal Link Dist (ft)		292			270			166			412	
Turn Bay Length (ft)						60			60			60
Base Capacity (vph)		1019			1212	693	834	831	435	842		519
Starvation Cap Reductn		0			0	0	0	0	0	0		0
Spillback Cap Reductn		0			0	0	0	0	0	0		0
Storage Cap Reductn		0			0	0	0	0	0	0		0
Reduced v/c Ratio		0.08			0.31	0.11	1.33	1.17	0.35	0.45		0.58

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 64 (80%), Referenced to phase 5:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.33
Intersection Signal Delay: 101.4 Intersection LOS: F
Intersection Capacity Utilization 57.8% ICU Level of Service B
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Old Colony Ave & Mount Vernon St

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	388	356	223	314	11	926
Peak Hour Factor	0.79	0.93	0.78	0.89	0.69	0.92
Hourly flow rate (vph)	491	383	286	353	16	1007
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					Raised	
Median storage veh)					0	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			874		1431	437
vC1, stage 1 conf vol					683	
vC2, stage 2 conf vol					748	
vCu, unblocked vol			874		1431	437
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			63		89	0
cM capacity (veh/h)			768		142	570

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	327	547	404	235	351	671
Volume Left	0	0	286	0	16	0
Volume Right	0	383	0	0	336	671
cSH	1700	1700	768	1700	502	570
Volume to Capacity	0.19	0.32	0.37	0.14	0.70	1.18
Queue Length 95th (ft)	0	0	43	0	136	584
Control Delay (s)	0.0	0.0	10.3	0.0	27.3	121.3
Lane LOS			B		D	F
Approach Delay (s)	0.0		6.5		89.0	
Approach LOS					F	

Intersection Summary			
Average Delay	37.5		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	55	284	187	3	257	26	30	9	11	8	6	77
Peak Hour Factor	0.58	0.93	0.88	0.38	0.92	0.60	0.81	0.56	0.44	0.88	0.30	0.67
Hourly flow rate (vph)	95	305	212	8	279	43	37	16	25	9	20	115
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		350										
pX, platoon unblocked												
vC, conflicting volume	323			518			882	940	259	692	1024	161
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	323			518			882	940	259	692	1024	161
tC, single (s)	4.1			4.1			7.7	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			99			78	93	97	97	91	86
cM capacity (veh/h)	1249			1058			172	244	746	287	217	846

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	95	204	314	148	183	78	144
Volume Left	95	0	0	8	0	37	9
Volume Right	0	0	212	0	43	25	115
cSH	1249	1700	1700	1058	1700	248	555
Volume to Capacity	0.08	0.12	0.18	0.01	0.11	0.31	0.26
Queue Length 95th (ft)	6	0	0	1	0	32	26
Control Delay (s)	8.1	0.0	0.0	0.5	0.0	26.0	13.7
Lane LOS	A			A		D	B
Approach Delay (s)	1.3			0.2		26.0	13.7
Approach LOS						D	B

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	9	12	11	16	12	13	15	12	12	16
Storage Length (ft)	0		0	0		60	0		60	0		60
Storage Lanes	0		0	0		1	2		1	2		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50	50		50
Trailing Detector (ft)	0	0			0	0	0	0	0	0		0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt						0.850			0.850			0.850
Flt Protected		0.992					0.950			0.950		
Satd. Flow (prot)	0	2838	0	0	3144	1695	3213	3730	1725	3127	0	1777
Flt Permitted		0.843					0.950			0.950		
Satd. Flow (perm)	0	2412	0	0	3144	1695	3213	3730	1725	3127	0	1777
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						79			124			121
Headway Factor	1.00	1.14	1.14	1.00	1.04	0.85	1.00	0.96	0.88	1.00	1.00	0.85
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		372			350			246			492	
Travel Time (s)		8.5			8.0			5.6			11.2	
Volume (vph)	21	124	0	0	452	91	257	262	102	275	0	405
Peak Hour Factor	0.71	0.74	0.25	0.25	0.83	0.89	0.77	0.81	0.82	0.85	0.25	0.89
Heavy Vehicles (%)	0%	16%	0%	0%	11%	8%	9%	0%	3%	12%	0%	3%
Adj. Flow (vph)	30	168	0	0	545	102	334	323	124	324	0	455
Lane Group Flow (vph)	0	198	0	0	545	102	334	323	124	324	0	455
Turn Type	Perm					Perm	Prot		Perm	Prot		custom
Protected Phases		5			6		2	3		1		4
Permitted Phases	5					6			3			
Detector Phases	5	5			6	6	2	3	3	1		4
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0		4.0
Minimum Split (s)	22.0	22.0			22.0	22.0	9.0	21.0	21.0	13.0		21.0
Total Split (s)	29.0	29.0	0.0	0.0	29.0	29.0	21.0	30.0	30.0	21.0	0.0	30.0
Total Split (%)	36.3%	36.3%	0.0%	0.0%	36.3%	36.3%	26.3%	37.5%	37.5%	26.3%	0.0%	37.5%
Maximum Green (s)	24.0	24.0			24.0	24.0	17.0	26.0	26.0	17.0		26.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	1.0	1.0	1.0	1.0		1.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min			C-Min	C-Min	None	None	None	None		None
Walk Time (s)	7.0	7.0			7.0	7.0		7.0	7.0	7.0		7.0
Flash Dont Walk (s)	10.0	10.0			10.0	10.0		7.0	7.0	2.0		10.0
Pedestrian Calls (#/hr)	0	0			0	0		0	0	0		0
Act Effct Green (s)		35.0			35.0	35.0	13.2	19.9	19.9	13.2		19.9
Actuated g/C Ratio		0.44			0.44	0.44	0.16	0.25	0.25	0.16		0.25
v/c Ratio		0.19			0.40	0.13	0.63	0.35	0.24	0.63		0.86
Control Delay		16.9			18.4	7.2	36.4	24.7	5.3	36.5		36.3
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		16.9			18.4	7.2	36.4	24.7	5.3	36.5		36.3
LOS		B			B	A	D	C	A	D		D
Approach Delay		16.9			16.7			26.6				
Approach LOS		B			B			C				
90th %ile Green (s)	24.0	24.0			24.0	24.0	17.0	26.0	26.0	17.0		26.0
90th %ile Term Code	Coord	Coord			Coord	Coord	Max	Hold	Hold	Max		Max
70th %ile Green (s)	28.3	28.3			28.3	28.3	14.7	24.0	24.0	14.7		24.0
70th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Gap		Gap
50th %ile Green (s)	33.5	33.5			33.5	33.5	13.0	20.5	20.5	13.0		20.5
50th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Gap		Gap
30th %ile Green (s)	38.4	38.4			38.4	38.4	11.7	16.9	16.9	11.7		16.9
30th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Gap		Gap
10th %ile Green (s)	45.6	45.6			45.6	45.6	9.5	11.9	11.9	9.5		11.9
10th %ile Term Code	Coord	Coord			Coord	Coord	Gap	Hold	Hold	Hold		Gap
Queue Length 50th (ft)		31			95	6	81	68	0	78		160
Queue Length 95th (ft)		52			151	40	96	83	28	105		244
Internal Link Dist (ft)		292			270			166			412	
Turn Bay Length (ft)						60			60			60
Base Capacity (vph)		1054			1374	785	683	1212	644	664		659
Starvation Cap Reductn		0			0	0	0	0	0	0		0
Spillback Cap Reductn		0			0	0	0	0	0	0		0
Storage Cap Reductn		0			0	0	0	0	0	0		0
Reduced v/c Ratio		0.19			0.40	0.13	0.49	0.27	0.19	0.49		0.69

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 67 (84%), Referenced to phase 5:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 26.3 Intersection LOS: C
Intersection Capacity Utilization 54.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Old Colony Ave & Mount Vernon St

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	377	256	359	652	3	367
Peak Hour Factor	0.93	0.84	0.79	0.91	0.38	0.89
Hourly flow rate (vph)	405	305	454	716	8	412
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					Raised	
Median storage veh)					0	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			710		1825	355
vC1, stage 1 conf vol					558	
vC2, stage 2 conf vol					1267	
vCu, unblocked vol			710		1825	355
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			49		89	36
cM capacity (veh/h)			885		70	641

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	270	440	693	478	145	275
Volume Left	0	0	454	0	8	0
Volume Right	0	305	0	0	137	275
cSH	1700	1700	885	1700	444	641
Volume to Capacity	0.16	0.26	0.51	0.28	0.33	0.43
Queue Length 95th (ft)	0	0	75	0	35	54
Control Delay (s)	0.0	0.0	11.4	0.0	17.0	14.8
Lane LOS			B		C	B
Approach Delay (s)	0.0		6.8		15.5	
Approach LOS					C	

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	68	404	30	1	365	11	103	0	45	11	1	45
Peak Hour Factor	0.70	0.80	0.81	0.25	0.91	0.56	0.71	0.25	0.79	0.63	0.25	0.79
Hourly flow rate (vph)	97	505	37	4	401	20	145	0	57	17	4	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		350										
pX, platoon unblocked												
vC, conflicting volume	421			542			985	1147	271	923	1155	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	421			542			985	1147	271	923	1155	210
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	8.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	5.0	3.3
p0 queue free %	91			100			15	100	92	91	95	93
cM capacity (veh/h)	1114			1037			170	183	733	196	86	792

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	97	337	205	205	220	202	78
Volume Left	97	0	0	4	0	145	17
Volume Right	0	0	37	0	20	57	57
cSH	1114	1700	1700	1037	1700	217	378
Volume to Capacity	0.09	0.20	0.12	0.00	0.13	0.93	0.21
Queue Length 95th (ft)	7	0	0	0	0	196	19
Control Delay (s)	8.5	0.0	0.0	0.2	0.0	91.1	17.0
Lane LOS	A			A		F	C
Approach Delay (s)	1.3			0.1		91.1	17.0
Approach LOS						F	C

Intersection Summary			
Average Delay	15.3		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix B

DETAILED TRIP GENERATION

Bayside TOD - Corcoran/Jennison

Detailed Trip Generation Estimate: Proposed

Howard/Stein-Hudson Associates

Revised: 11/29/12 - Apartments increased from 175 to 186 by Corcoran-Jennison

Component	Size	Category	Trip Rates (Trips/ksf or unit)	Unadjusted Vehicle Trips	National vehicle occupancy rate[1]	**Converted to Person trips**	Capture Rate	Person Trips less Capture Rate	Transit Share[2]	**Transit Trips**	Walk/Bike/ Other Share[2]	**Walk/ Bike/ Other Trips**	Vehicle Share[2]	Vehicle Person Trips	Local vehicle occupancy rate[3]	**Total Adjusted Vehicle Trips**		
Daily Trip Generation																		
Apartment[4]	186	Total	6.72	1251	1.2	**1,501**	0%	1501	23%	**345**	24%	**360**	53%	795	1.25	**636**	100.00%	
	units	In	3.36	625	1.2	**750**	0%	750	23%	**173**	24%	**180**	53%	398	1.25	**318**		
		Out	3.36	625	1.2	**750**	0%	750	23%	**173**	24%	**180**	53%	398	1.25	**318**		
Retail[5]	10	Total	42.94	429	1.8	**773**	0%	773	15%	**116**	24%	**186**	61%	471	1.8	**262**	100.00%	262
	ksf	In	21.47	215	1.8	**386**	0%	386	15%	**58**	24%	**93**	61%	236	1.8	**131**		131
		Out	21.47	215	1.8	**386**	0%	386	15%	**58**	24%	**93**	61%	236	1.8	**131**		131
																		0
Daily Total		Total		1,680		**2,274**		2,274		**461**		**546**		1,267		**898**		898
		In		840		**1,137**		1,137		**231**		**273**		633		**449**		449
		Out		840		**1,137**		1,137		**231**		**273**		633		**449**		449
AM Peak-hour Trip Generation																		0
Apartment[4]	186	Total	0.51	95	1.2	**114**	0%	114		**30**		**32**		51	1.25	**41**		41
	units	In	0.10	19	1.2	**23**	0%	23	29%	**7**	22%	**5**	49%	11	1.25	**9**	100.00%	9
		Out	0.41	76	1.2	**91**	0%	91	26%	**24**	30%	**27**	44%	40	1.25	**32**	100.00%	32
																		0
Retail[5]	10	Total	1.00	10	1.8	**18**	0%	18		**3**		**4**		10	1.8	**6**		6
	ksf	In	0.61	6	1.8	**11**	0%	11	15%	**2**	20%	**2**	65%	7	1.8	**4**	100.00%	4
		Out	0.39	4	1.8	**7**	0%	7	25%	**2**	30%	**2**	45%	3	1.8	**2**	100.00%	2
																		0
AM Peak Total		Total		105		**132**		132		**34**		**37**		62		**47**		47
		In		25		**34**		34		**8**		**7**		18		**13**		13
		Out		80		**98**		98		**25**		**29**		43		**34**		34
PM Peak-hour Trip Generation																		0
Apartment[4]	186	Total	0.64	120	1.2	**144**	0%	144		**39**		**39**		66	1.25	**53**		53
	units	In	0.42	78	1.2	**94**	0%	94	26%	**24**	30%	**28**	44%	41	1.25	**33**	100.00%	33
		Out	0.23	42	1.2	**50**	0%	50	29%	**15**	22%	**11**	49%	25	1.25	**20**	100.00%	20
																		0
Retail[5]	10	Total	3.73	37	1.8	**67**	0%	67		**13**		**17**		37	1.8	**21**		21
	ksf	In	1.83	18	1.8	**32**	0%	32	25%	**8**	30%	**10**	45%	15	1.8	**8**	100.00%	8
		Out	1.90	19	1.8	**35**	0%	35	15%	**5**	20%	**7**	65%	23	1.8	**13**	100.00%	13
																		0
PM Peak Total		Total		157		**211**		211		**52**		**56**		103		**73**		73
		In		96		**126**		126		**32**		**38**		56		**41**		41
		Out		61		**85**		85		**20**		**18**		47		**32**		32

Notes:

1. National vehicle occupancy rates based on the 2001 National Household Travel Survey
2. Mode shares based on data for BTD Area 8
3. Local vehicle occupancy rates based on 2000 Census (residential) and 2001 National Household Travel Survey data (retail)
4. ITE Trip Generation, 8th Edition, LUC 220 (Apartment), equation.
5. ITE Trip Generation, 8th Edition, LUC 820 (Shopping Center), average rate.