TRANSPORTATION IMPACT STUDY

Conservatory Lab Charter School

395 Columbia Road
Boston, Massachusetts

PREPARED FOR

Conservatory Lab Charter School
2120 Dorchester Avenue
Boston, MA 02124
617.254.8904

PREPARED BY

vhb

99 High Street, 10th Floor
Boston, MA 02110
617.607.7777

AUGUST 2017

Table of Contents

List of Tables

List of Figures

1

Introduction

This transportation study presents an evaluation and summary of existing and future transportation infrastructure and operations that are expected relative to the development of the Conservatory Lab Charter School (CLCS) at 395 Columbia Road in Boston's Dorchester neighborhood. CLCS proposes to relocate their existing Upper School and programs supporting the school from their current location at Steward Carney Hospital to this site adjacent to the intersection of Columbia Road and Quincy Street, less than a half mile from their Lower School location on Hancock Street in Dorchester. This transportation study has been developed in order to understand the transportation impacts of the Project and to develop appropriate transportation infrastructure improvements that mitigate the impacts of the Proposed Project.

The transportation study includes an analysis of the following:

- Vehicle traffic on study area roadways and intersections;
- Parking conditions;
- Loading and service activities;
- Pedestrian activities;
- Public transportation services; and
- Accident history.

In addition, this study quantifies and assesses the transportation impacts that are expected under future conditions. The purposes of these analyses are to:

- Define and quantify existing transportation conditions in the Project study area;
- Estimate the transportation impacts that will be generated under future conditions based on anticipated traffic activities generated by the Proposed Project; and
- Develop a set of improvement strategies and measures, which will help reduce the impacts of single occupancy vehicle (SOV) trips and promote the use of sustainable modes including public transportation, walking and biking, as well as carpool/vanpool.

The following sections provide an overview of the Project and a summary of findings of the transportation analysis, including anticipated impacts, proposed improvements, a discussion of the study methodology, and a description of the study area. Subsequent sections provide detailed discussions of existing and future transportation conditions expected both with and without the Proposed Project. The final section presents a detailed summary of transportation improvement actions that the Proponent is committed to implementing in connection with the Project.

1.1 Project Description

The Conservatory Lab Charter School (CLCS) proposes to construct an approximately 43,500 gross square foot (GSF) Upper School on Columbia Road in Boston's Dorchester neighborhood. The school is separated into a Lower School, kindergarten through second grade, and an Upper School, third through eighth grade. Currently the Upper School, located in a temporary facility at Carney Hospital, is more than two miles from the existing Lower School, located on Hancock Street in Upham's Corner. The Proposed Project will bring the two schools within less than a half-mile of each other. CLCS wants to create a campus atmosphere by operating the Upper School in a permanent, state-of-the art facility in the revitalized Upham's Corner neighborhood and within walking distance of the existing Lower School.

The Proposed Project includes a new three-story classroom building with an attached one-story non-regulation sized gymnasium. The new facility will enable this diverse school to provide a more appropriate campus setting for its students and expand its educational curriculum. At capacity, the school will house approximately 275 students and 55 full-time equivalent faculty/staff.

The school is designed to accommodate older students on the top floor and the younger students and administration on the lower two floors of the facility. A cafeteria/ common space will activate the corner of Columbia Road and Quincy Street with smaller ensemble practice rooms above. The gymnasium will provide students with opportunity for physical activity throughout the school year. A full orchestra ensemble room, opening up to a performance courtyard, on the back side of the building will enable students to showcase their talents to small gatherings

with this exciting collaboration of indoor and outdoor spaces. **Figure 1** illustrates the school's ground floor plan, as described above.

The site circulation infrastructure has been designed to carry school buses and passenger vehicles into the school campus in a one-way direction from Columbia Road to Quincy Street during peak drop-off/pick-up time periods. This internal drive lane will serve as both internal access/circulation and parent/school bus drop-off/pick-up. Approximately 43 parking spaces will be provided on-site for visitors and faculty/staff. **Figure 2** depicts the proposed site plan for the Project and the capacity of the internal driveway to accommodate up to 9 busses and 17 passenger cars in two dedicated drop-off lanes.

1.2 Site Access and Improvements

The Project site will be accessed via a single, one-way driveway with an entrance along Columbia Road and an exit onto Quincy Street. The driveway will provide access to the campus with dedicated visitor and faculty/staff parking and school bus and parent drop-off/pick-up area as illustrated previously in, Figure 2. School drop-off will occur around 9:15 AM, generally after the morning commuter peak period, while pick-up will occur around 4:30 PM, before the afternoon commuter peak period. Drop-off/pick-up activity will be managed via a proactive traffic management plan that is intended to eliminate school bus/passenger vehicle conflicts on-site, expedite the loading and unloading of students, and eliminate these activities from occurring on adjacent public streets. School faculty and staff will implement this plan daily, as required.

The Project will construct approximately 43 parking spaces located on-site, which are intended for CLCS staff and visitors. The School's main egress on Quincy Street will be stop-controlled and all vehicular activities will be accommodated internal to the Site. Both driveways will be constructed with ADA accessible pedestrian amenities in order to safely manage pedestrian traffic in conjunction with vehicular movements. On-site pedestrian amenities include sidewalks surrounding the school buildings and crosswalks to safely guide students between the drop-off/pick-up area and the school sidewalk.

1.3 Summary of Findings

A summary of key findings of the transportation analysis for the Project is as follows:

- The Project will generate approximately 66 entering and 48 exiting vehicle trips during the weekday morning peak hour (7:00 AM – 8:00 AM) and approximately 44 entering and 62 exiting vehicle trips during the weekday evening peak hour (4:15 PM – 5:15 PM).
- A single drop-off/pick-up area will be used by both parents and school buses – with dedicated lanes for each. The area will be located internal to the Site, completely off of Columbia Road and Quincy Street.
- Morning arrival is expected to begin about 30 minutes before the start of the

school day around 9:15 am. School buses will unload students along the drive isle closest to the school. Parents will drop-off their children along the outside drive isle.

- The School will maintain an active faculty/staff presence in the drop-off area during both the drop-off and pick-up periods to ensure student safety and streamline loading/unloading.
- The study area intersections will continue to operate at the same levels of service when the school opens as under future No-Build conditions, with the exception of Columbia Road at Quincy Street. During the evening peak hour, the overall intersection LOS is estimated to change from LOS D to LOS E, although this decrease is due to only a nine second increase in delay. While the morning peak hour operates at an LOS F under both no-build and build conditions, the Project does increase the overall intersection delay by 25 seconds during the morning arrival period. The increases in delay, for both peak hours, is due to an increase in Quincy Street WB traffic exiting the Project site and limited green time allocated to this movement.
- To mitigate the Project impacts on the Columbia Road/Quincy Street intersection, signal retiming and rephrasing alternatives were explored. During the morning peak hour, intersection operations could be reduced by up to 17 seconds with minor timing readjustments, while modifying signal phasing could decrease overall intersection delay by approximately 53 seconds. CLCS will work with the BTD to explore the potential to implement these signalization timing and phasing modifications.
- The School will provide accessible ramps, crosswalks, and sidewalks throughout the Project site.
- On-site parking will comprise of approximately 43 spaces, which will support parking for visitors and faculty/staff, while encouraging limited SOV trips.
- The Proponent is also committed to providing and enhancing a wide array of Transportation Demand Management (TDM) measures offered to faculty and staff as a means to reduce vehicle trips to the site and encourage the use of sustainable transportation modes.

1.4 Study Methodology

The transportation analysis provides an evaluation of anticipated impacts of the Project on the surrounding transportation environment. This analysis was conducted in three phases. The first phase involved defining and quantifying the existing transportation conditions in the Project study area including roadway and intersection geometrics and traffic characteristics for the surrounding transportation infrastructure.

The second phase of the study estimates the future transportation conditions in the Project study area by adding the traffic impacts from projected background traffic growth and other planned developments in the area, and an estimate of traffic demands to be generated by the Project to the existing conditions defined in phase

one. The first and second phases utilize Synchro version 9 to analyze the 2017 Condition as well as the 2022 No-Build and Build Conditions.

The third phase of the study identified measures to improve future transportation conditions including developing improvement strategies, such as Transportation Demand Management actions, signal adjustments, and Project site access/circulation improvements, to lessen the transportation impacts of the Project.

Study Area

The study area includes segments of Columbia Road and Quincy Street in the Dorchester neighborhood of Boston. The study area includes eight key intersections as illustrated in **Figure 3**.

Signalized Intersections

1. Columbia Road at Ceyton Street/ Columbia Terrace
2. Columbia Road at Quincy Street
3. Columbia Road at Glendale Street/ Bellevue Street

Unsignalized Intersections

4. Columbia Road at Hamilton Street/ Richfield Street
5. Columbia Road at Site Driveway
6. Bellevue Street at Trull Street/ Ronan Street
7. Quincy Street at Stanley Street
8. Quincy Street at Mt. Everest Street

Roadway Jurisdiction

All the study area roadways and intersections are regulated and maintained under the jurisdiction of the City of Boston. The City of Boston controls and maintains all traffic signal controls in the study area.

Source: Arrowstreet

Figure 1

First Floor Plan

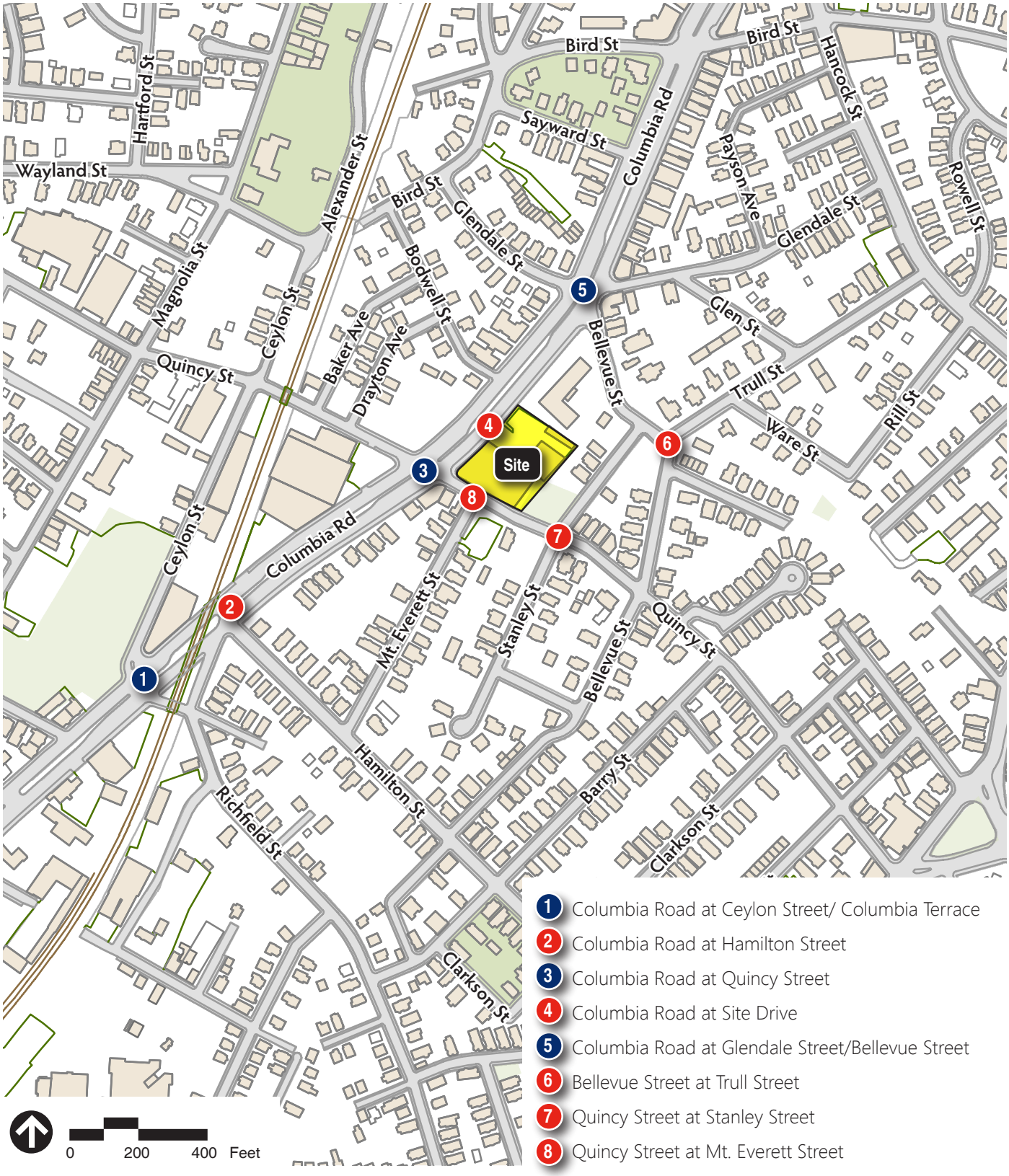
Conservatory Lab Charter School
Boston, Massachusetts

Source: Arrowstreet

Figure 2

Proposed Conditions

Conservatory Lab Charter School
Boston, Massachusetts



Source: MassGIS, City of Boston

Signalized Intersection

Unsignalized Intersection

Figure 3

Study Area Intersections

Conservatory Lab Charter School
Boston, Massachusetts

2

Existing Conditions

Evaluation of transportation impacts associated with the Proposed Project is based upon an understanding of the existing transportation system in the Project study area. The evaluation of existing transportation conditions in the study area includes roadway geometry, traffic controls, daily and peak hour traffic volumes, traffic safety data, pedestrian, and public transportation information. Each of these elements is described in the following sections.

The site is currently occupied by a one-story waterproofing company with over a quarter of the site utilized as a parking/storage area for vehicles and supplies, as shown in **Figure 4**. As observed, the site has a relatively modest (5-10 vehicles per hour), flow of vehicular traffic entering and exiting the site throughout the day.

2.1 Roadway Conditions

The principal roadways and intersections in the Project study area are described briefly below. The descriptions of the roadways include physical characteristics, adjacent land uses and traffic control devices.

Roadways

The following are the key roadways evaluated in this transportation analysis:

Columbia Road

Columbia Road is a median-divided roadway with four lanes traveling in the northeast/southwest direction bounded by Interstate 93 on the northeast and Blue Hill Avenue to the southwest. The Project site has access to Columbia Road, just east of the Columbia Road/Quincy Street intersection. The roadway provides sidewalks along both sides of the corridor and allows for parking within most of the study area. MBTA Bus Route 16 runs along Columbia Road within the study area. Land uses adjacent to Columbia Road near the Project site consist of residential uses with some commercial space.

Bellevue Street

Bellevue Street is a two-lane roadway traveling in the north-south direction. Bellevue Street connects to Columbia Street and Quincy Street. In the study area, Bellevue Street provides sidewalks on both sides of the roadway. Land uses adjacent to Bellevue consists of residential uses. On-street parking consists of unrestricted parking and no-parking areas.

Quincy Street

Quincy Street is a two-lane roadway traveling in the east-west direction. The Project runs along Quincy Street, from Columbia Road to Quincy Stanley Park. In the study area, Quincy Street provides sidewalks on both sides of the roadway. Land uses adjacent to Quincy consists of residential uses. On-street parking consists of unrestricted parking and no-parking areas.

Intersections

The following are the key intersections evaluated in this transportation analysis:

Columbia Road at Ceyton Street/ Columbia Terrace

Columbia Road/Ceyton Street/ Columbia Terrace is a four-legged signalized intersection, which operates with four phases including an actuated, exclusive pedestrian phase. The eastbound Ceyton Street approach is a one-lane approach with adjacent parking. The westbound Columbia Terrace approach is a one-lane approach. Each of the Columbia Road approaches consists of a left-turn bay, a through lane and a shared through/right lane with adjacent bike lane and parking lane. Crosswalks and sidewalks are provided at all approaches.

Columbia Road at Hamilton Street/ Richfield Street

Columbia Road/Hamilton Street/ Richfield Street is a four-legged stop controlled intersection. The Hamilton Street westbound approach is a one-lane right turn only approach; left turns into Richfield Street are prohibited. The Richfield Street north-westbound approach is a one-lane approach with adjacent parking. The Columbia Road northbound approach provides a through lane and a shared through/ right lane, while the southbound approach provides two through lanes and a left turn bay.

Columbia Road provides adjacent bike lanes and parking lanes. Sidewalks are provided along all approaches of the intersection and crosswalks are available across Hamilton and Richfield Streets.

Columbia Road at Quincy Street

Columbia Road/Quincy Street is a four-legged signalized intersection, which operates as a three-phase intersection with concurrent pedestrian phases. Quincy Street travels east-west and provides a lane of travel in each direction. Each of the Columbia Road approaches consists of a left-turn bay, a through lane and a shared through/right lane with adjacent bike lane and parking lane. Crosswalks and sidewalks are provided at all approaches. MBTA bus stops are located along Columbia Road, adjacent to the intersection.

Columbia Road at Glendale Street/ Bellevue Street

Columbia Road/Glendale Street/Bellevue Street is a five-legged signalized intersection, which operates with five phases including an actuated, exclusive pedestrian phase. Glendale is a one-way, one-lane road traveling from west to east and provides adjacent parking lanes on both sides of the road. The north-westbound Bellevue approach is a one-lane approach with adjacent parking. Each of the Columbia Road approaches consists of a left-turn bay, a through lane and a shared through/right lane with adjacent bike lane and parking lane. Crosswalks and sidewalks are provided at all approaches. MBTA bus stops are located along Columbia Road, adjacent to the intersection.

Bellevue Street at Trull Street/ Ronan Street

The Bellevue Street/Trull Street/ Ronan Street is a four-legged unsignalized intersection. The Bellevue Street has eastbound and northbound approaches; both are one-lane approach with adjacent parking. The southbound Trull approach is a one-way approach travelling away from the intersection. The westbound Ronan approach is a dead-end, two-lane roadway with adjacent parking. Crosswalks are provided across the Bellevue eastbound and Ronan westbound approaches.

Quincy Street at Stanley Street

Quincy Street/Stanley Street is a four-legged unsignalized intersection. Stanley Street is a one-way roadway traveling southbound which consists of a shared left/through/ right lane with adjacent parking. Quincy Street travels east-west and each of the approaches consists of a shared left/through/ right lane with adjacent parking. Sidewalks are provided along all approaches and no crosswalks are provided across the roads.

Quincy Street at Mt. Everest Street

Quincy Street/Mt. Everett Street is a three-legged unsignalized intersection. The northbound approach provides a one general travel lane with adjacent on-street

parking. Quincy Street travels east-west and each of the approaches consists of a shared left/through/ right lane. Sidewalks are provided at all approaches.

2.2 Traffic Volume Data Collection

To better assess the study area's existing conditions, traffic volumes were collected. Turning Movement Counts (TMCs) were conducted on Wednesday, May 17, 2017. TMCs took place during the morning peak period of 7:00 AM – 9:00 AM and the evening peak period of 4:00 PM – 6:00 PM.

In addition to the TMCs, two Automatic Traffic Recorder (ATR) Counts were conducted over a 48-hour period from on Tuesday, May 16, 2017 to Wednesday, May 18, 2017. One ATR was placed on Columbia Road, just north of Quincy Street and another was placed on Quincy Street east of Mt. Everest Street.

TMC and ATR raw data are provided in the Appendix.

Existing Traffic Volumes

The intersection TMCs were used to establish traffic networks for the 2017 Existing Condition for the weekday morning and evening peak hours. The study area's overall weekday morning peak hour was determined to occur between 7:00 AM and 8:00 AM, outside of the School's morning drop-off time. The area's overall evening peak hour was determined to occur between 4:15 PM and 5:15 PM, which coincides with the School's afternoon pick-up time. The 2017 Existing Condition weekday morning and evening peak hour traffic volumes are shown in **Figure 5 and Figure 6,** respectively.

Table 1 presents a summary of the daily traffic volumes calculated from the ATR counts. As shown in the table, Columbia Road north of Quincy carries approximately 31,000 vehicles per day (vpd).

Table 1 Existing Traffic Volumes Summary

Location	Daily	Peak Hour					
		Weekday Morning			Weekday Evening		
	Weekday (vpd)[1]	Volume (vph)[2]	"K" Factor[3]	Directional Distribution	Volume (vph)[2]	"K" Factor[3]	Directional Distribution
Columbia Road (North of Quincy Street)							
Northbound	16,214	1,237	0.08	64%	977	0.06	49%
Southbound	15,166	711	0.05	36%	1005	0.08	51%
Total	31,380	1,948	0.06	100%	1,982	0.06	100%
Quincy Street (East of Mt. Everett Street)							
Westbound	5,905	418	0.07	53%	361	0.06	46%
Eastbound	6,766	375	0.06	47%	432	0.06	54%
Total	12,671	793	0.06	100%	793	0.06	100%

Source: Automatic Traffic Recorder (ATR) counts conducted by PDI in May 2017

1. Daily traffic expressed in vehicles per day.
2. Peak hour volumes expressed in vehicles per hour.
3. Percent of daily traffic that occurs during the peak hour.

2.3 Parking

This section identifies the parking supply within the study area, including both on-site and on-street parking.

On-Site Parking

In its existing conditions, the Project site provides 17 marked, off-street parking spaces. However, observations showed many of these spaces covered with various debris and materials and were therefore unable to be used for parking, while other unmarked spaces were occupied by various sized vehicles. About 25 vehicles were observed to be parked on-site under existing conditions. The site is currently open at the Columbia Road entrance and gated at the Quincy Street entrance.

On-Street Parking

Within the study area, on-street parking is predominately unregulated or signed as no parking zones. **Figure 7** illustrates the existing curb use and parking restrictions within a quarter mile radius of the Project site.

2.4 Existing Site-Generated Traffic Volumes

The Project site is currently occupied by an industrial land use with driveways on Columbia Road and Quincy Street. However, the driveway to Quincy Street is typically gated and locked. Traffic volume counts were conducted at the Columbia Road driveway and credit was taken for all existing site-generated traffic volume that

would be eliminated with the relocation of this existing use. **Table 2** summarizes the peak hour volumes entering and exiting the site currently. While the peak hour trips are low, it was observed that there is a steady stream of vehicles entering and exiting the site, similar to the volumes counted during the peak hours, throughout the whole day.

Table 2 Existing Site Generated Trips

	Morning Peak Hour	Evening Peak Hour
In	5	0
Out	5	5
Total	**10**	**5**

2.5 Pedestrian and Bicycle Infrastructure

The morning and evening peak hour pedestrian counts for each study area intersection are presented in **Figure 8** and **Figure 9**, respectively. Key observations of pedestrian activities in the study area include:

- Sidewalks are provided along all study area roadways and intersections.
- Crosswalks are provided across the majority of streets at study area intersections.
- The study area intersections with the highest pedestrian volumes were Columbia Road/Glendale Street/Bellevue Street and Columbia Street/Quincy Street. The intersection of Columbia Road/Glendale Street/Bellevue Street experienced a total of 134 and 218 pedestrian crossings per hour during the weekday morning and evening peak hours, respectively. The intersection of Columbia Street/Quincy Street experienced a total of 105 and 113 pedestrian crossings per hour during the weekday morning and evening peak hours, respectively.

Morning and evening bicycle counts were conducted in conjunction with vehicle and pedestrian counts and are presented in **Figures 10** and **Figure 11**.

Hubway is a bicycle sharing system in Boston, Brookline, Cambridge, and Somerville that provides more than 1,800 bicycles at 185 stations. Within the study area, the closest Hubway station is at the intersection of Columbia at Ceylon Street, about a 4-minute walk from the Project site. This station provides a total of 15 bicycles for shared use.

2.6 Car Sharing Services

Zipcar is a car sharing service provided to users as an alternative to owning and traditionally renting a vehicle. Members of Zipcar rent vehicles by the hour or day, and gas and insurance is included in the rental. There are several Zipcar locations to the north of the site along Columbia Road near Upham's Corner. These locations provide members with 4 vehicles for rent. These cars could be used by faculty and

staff as a flexible means to commute to and from the school, or run errands during the day for those that use public transportation.

2.7 Public Transportation

Massachusetts Bay Transportation Authority (MBTA) services near the Project site include three bus lines and the Red Line. These services, illustrated in **Figure 12**, are described in further detail below.

Bus Service

Three bus routes are available near the Project site and are described below.

- Route 15 (Kane Sq. or Fields Corner Station – Ruggles Station via Upham's Corner) provides service along Bowdoin Street with a stop adjacent to the Hancock Street/ Columbia Road intersection. Bus service is provided between the hours of 3:33 AM and 12:46 AM on weekdays and weekends. The route terminates at Ruggles Station which provides connections to the Orange Line, Commuter Rail Needham, Franklin, and Providence Lines and Bus Routes 8, 15, 19, 22, 23, 25, 28, 42, 43, 44, 45, 47, CT2, and CT3. This route is scheduled to operate approximately six inbound and seven outbound busses during the morning peak hour and five busses in both directions during the evening peak hour. Three outbound busses, terminating near the Project site, are schedules to operate within thirty minutes before of the normal school drop-off time of 9:15 AM. Three inbound busses are scheduled to operate within the study area thirty minutes after the normal school pick-up time of 4:30 PM.
- Route 16 (Forrest Hills Station – Andrew Station/UMass via Columbia Road) provides service along Columbia Road with an outbound stop adjacent to the site and an inbound stop across the street. On the weekdays, between 5:00 AM and 1:46 AM, the bus route runs between Forrest Hills Station and Andrew Station. From 7:03 to 9:50 AM and 2:40 to 6:31 PM, the bus route continues past Andrew Station to the UMass Boston Busway. On Saturday, the bus route is from Forrest Hills Station to Andrew Station between the hours of 5:05 AM and 1:38 AM. Sunday service begins at 7:05 AM and ends at 1:28 AM. Andrew Station provides connections to the Red Line, as well as Bus Routes 5, 10, 16, 17, 18, 171, and CT3. This route is scheduled to operate approximately four inbound and five outbound busses during the morning peak hour and three to four busses during the evening peak hour. Two inbound and two outbound bus passing the Project site, are schedules to operate within thirty minutes before of the normal school drop-off time of 9:15 AM. Two busses in each direction, are scheduled to operate within thirty minutes after the normal school pick-up time of 4:30 PM.
- Route 17 (Fields Corner Station - Andrew Station via Upham's Corner & Edward Everett Square) provides bus service between Fields Corner Station and Andrew Station with a stop adjacent to the Hancock Street/ Columbia Road intersection. Bus service is provided from 5:12 AM to 10:14 PM on weekdays and between 5:04 AM and 10:04 PM during Saturdays. Service is also provided on Sundays between

the hours of 9:10 AM and 7:25 PM. Fields Corner Station provides a connection to the Red Line and Bus Routes 15, 17, 18, 19, 201, 202, and 210. This route is scheduled to operate approximately four inbound and four outbound busses during the morning peak hour and four busses in both directions during the evening peak hour. Two inbound and three outbound bus passing the Project site, are schedules to operate within thirty minutes before of the normal school drop-off time of 9:15 AM. Two busses in each direction, are scheduled to operate within thirty minutes after the normal school pick-up time of 4:30 PM.

Subway

Connections to the MBTA's Red and Orange Line are provided by Bus 16 at Andrew Station and Bus 15 at Ruggles Station, respectively. The Red Line provides access to downtown Boston, extending north to Alewife, and in addition, transfers can be made at JFK/UMass Station to travel south to Braintree. The Red Line connects to the Commuter Rail, Silver Line, Orange Line, and Green Line at various downtown stations. The Orange Line provides access to downtown Boston, extending north to Oak Grove Station in Malden and south to Forest Hills Station. The Orange Line connects to the Commuter Rail, Silver Line, Red Line, and Green Line at various downtown stations.

Commuter Rail

The commuter rail runs near to the Project site, with the closest station, Upham's corner Station, approximately half a mile north of the site. Upham's Corner Station is served by the Fairmont and Franklin Lines. Both lines terminate/originate at South Station in Boston which provides connections to numerous MBTA Commuter Rail lines and the MBTA's Red Line, Silver Line, and Bus Routes 7, 11, 448, 449, and 459.

2.8 Accident History

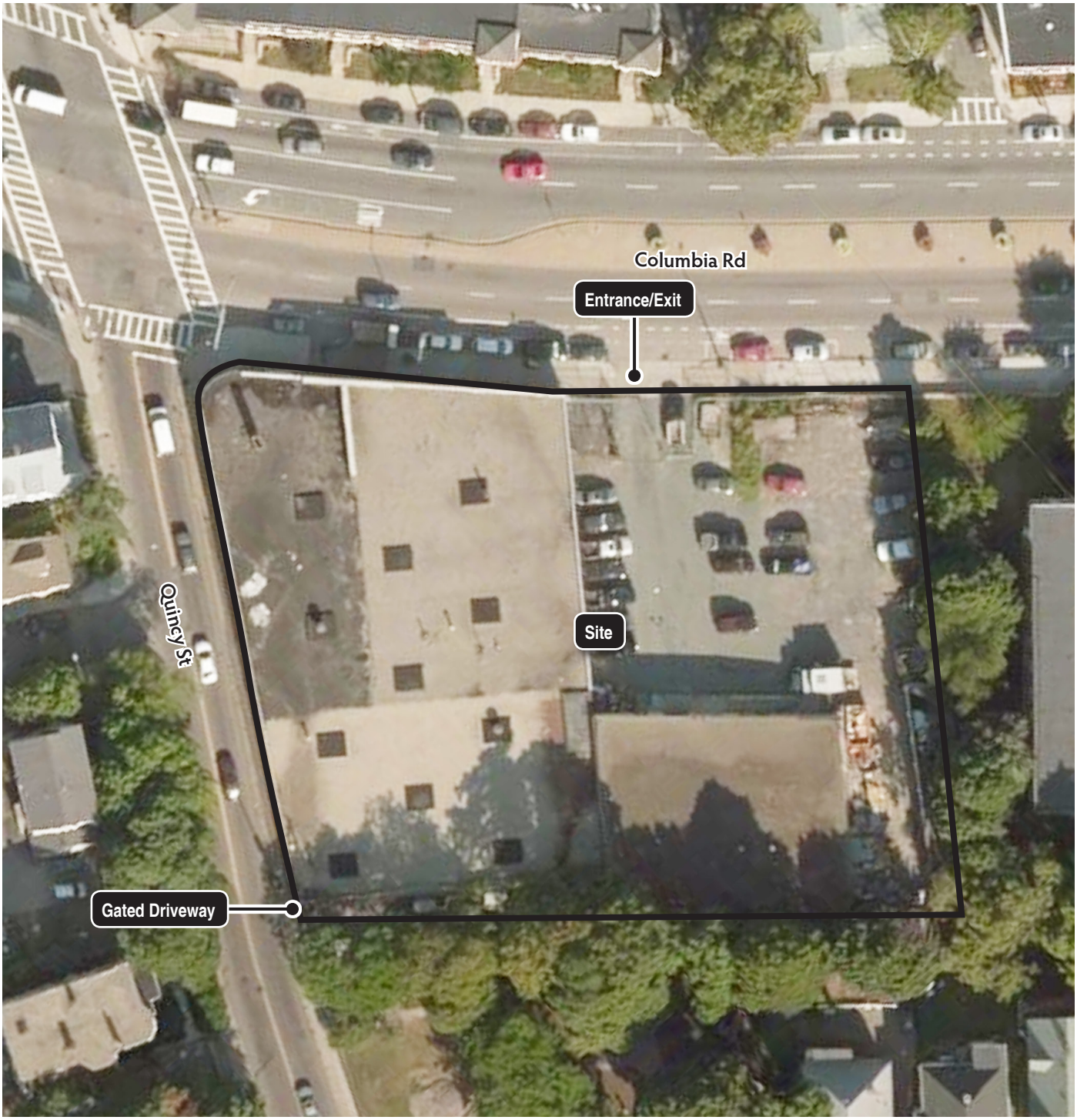
To identify accident trends and/or roadway safety deficiencies in the study area, crash data were obtained from the MassDOT records for the City of Boston for the most recent three-year time period available (2012 through 2014). A summary of the crash data is presented in **Table 3**. The average crash rate (crashes per million entering vehicles) for District 6, the MassDOT district the site is in, is 0.70 crashes per million entering vehicles for signalized intersections and 0.53 crashes per million entering vehicles for unsignalized intersections

There were 38 recorded crashes at the study area intersections over the three-year period that was studied. Columbia Road at Quincy Street had the most crashes over the three-year period with fourteen. One intersection, Bellevue Street/ Trull Street/ Ronan Street is above the District 6 average crash rate, but had only two reported crashes in the most recent three-year period. Therefore, the elevated crash rate is likely due to the low volume processed at this intersection.

Table 3 Vehicular Crash Summary (2012 to 2014)

	Columbia Rd at					Bellevue Street at	Quincy Street at	
	Ceylon St/ Columbia Ter	Hamilton Street	Quincy Street	Site Drive	Glendale/ Bellevue Street	Trull/ Ronan Street	Stanley St	Mt. Everest St
Currently Signalized?	Yes	No	Yes	No	Yes	No	No	No
MassHighway ACR	0.70	0.53	0.7	0.53	0.70	0.53	0.53	0.53
MassHighway CCR	0.14	0.35	0.43	0.04	0.08	0.87	0.53	0.11
Exceeds?	No	No	No	No	No	Yes	No	No
Year								
2012	2	4	3	0	0	1	2	1
2013	2	3	4	0	0	1	0	0
2014	0	2	7	1	2	0	3	0
Total	4	9	14	1	2	2	5	1
Collision Type								
Angle	0	2	4	0	0	1	0	0
Head-on	0	1	2	0	0	0	1	0
Rear-end	1	0	2	1	0	0	0	0
Sideswipe, opposite direction	3	0	2	0	0	0	0	0
Sideswipe, same direction	0	0	1	0	0	1	2	0
Single vehicle crash	0	1	3	0	0	0	1	0
Unknown	0	0	0	0	0	0	0	0
Not reported	0	5	0	0	2	0	1	1
Total	4	9	14	1	2	2	5	1
Crash Severity								
Fatal injury	0	0	0	0	0	0	0	0
Non-fatal injury	2	5	7	1	1	1	2	1
Property damage only	2	0	4	0	0	0	1	0
Not Reported	0	4	3	0	1	1	2	0
Unknown	0	0	0	0	0	0	0	0
Total	4	9	14	1	2	2	5	1
Time of Day								
Weekday, 7:00 AM - 9:00 AM	0	1	0	0	1	0	0	0
Weekday, 4:00 PM - 6:00 PM	0	0	1	1	1	0	1	1
Saturday, 11:00 AM - 2:00 PM	0	1	0	0	0	0	0	0
Weekday, other time	3	5	6	0	0	1	2	0
Weekend, other time	1	2	7	0	0	1	2	0
Total	4	9	14	1	2	2	5	1
Pavement Conditions								
Dry	4	4	12	0	0	2	3	0
Wet	0	1	2	1	0	0	0	0
Not reported	0	4	0	0	2	0	1	1
Total	4	9	14	1	2	2	5	1
Non Motroist (Bike, Pedestrian)	0	1	3	0	1	0	0	0
Total	0	1	3	0	1	0	0	0

Source: MassDOT Highway Division



Source: ArcGIS Bing Aerial

Figure 4

Existing Site Context

Conservatory Lab Charter School
Boston, Massachusetts

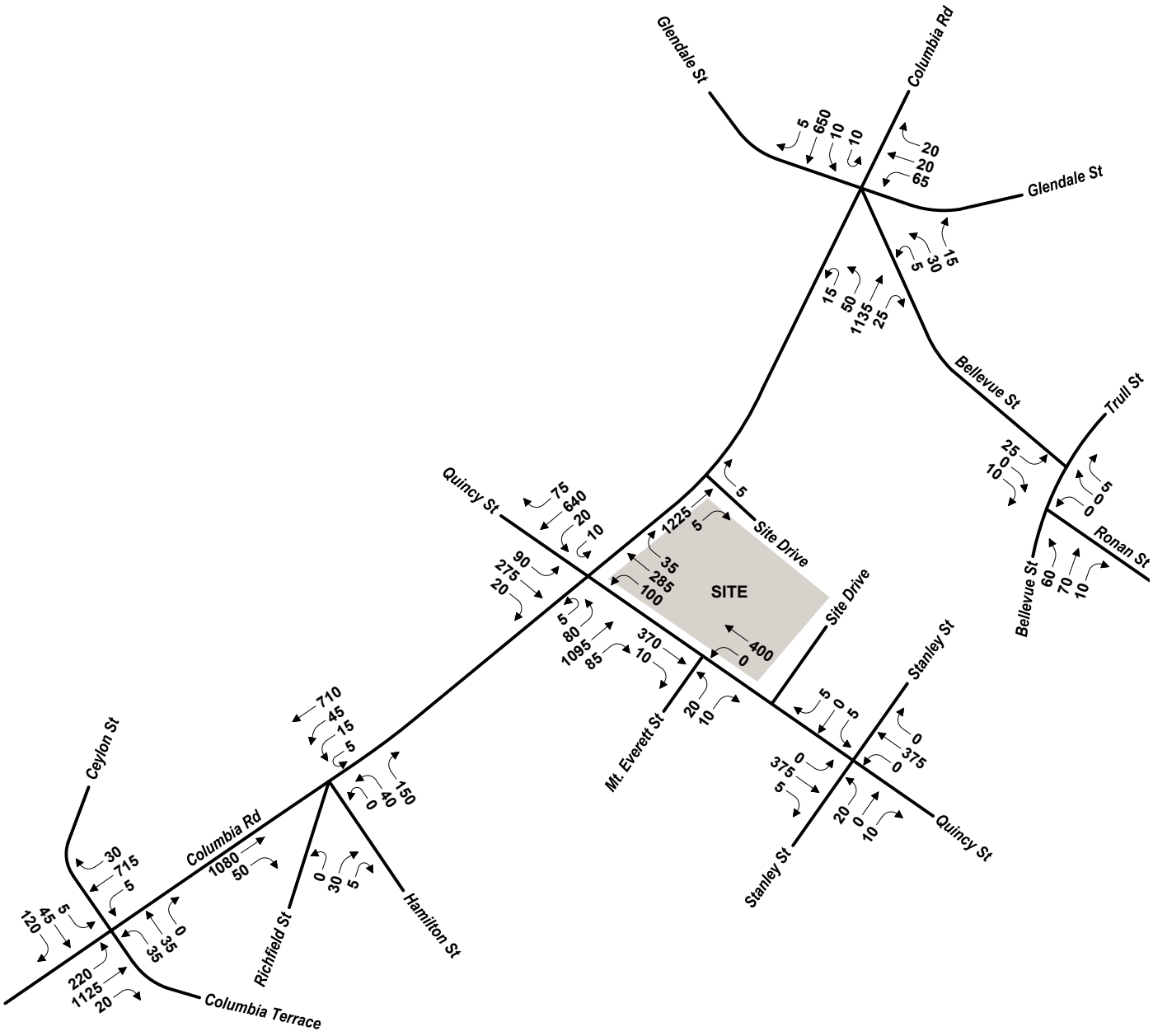


Figure 5

2017 Existing Condition Vehicle Volumes
Morning Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

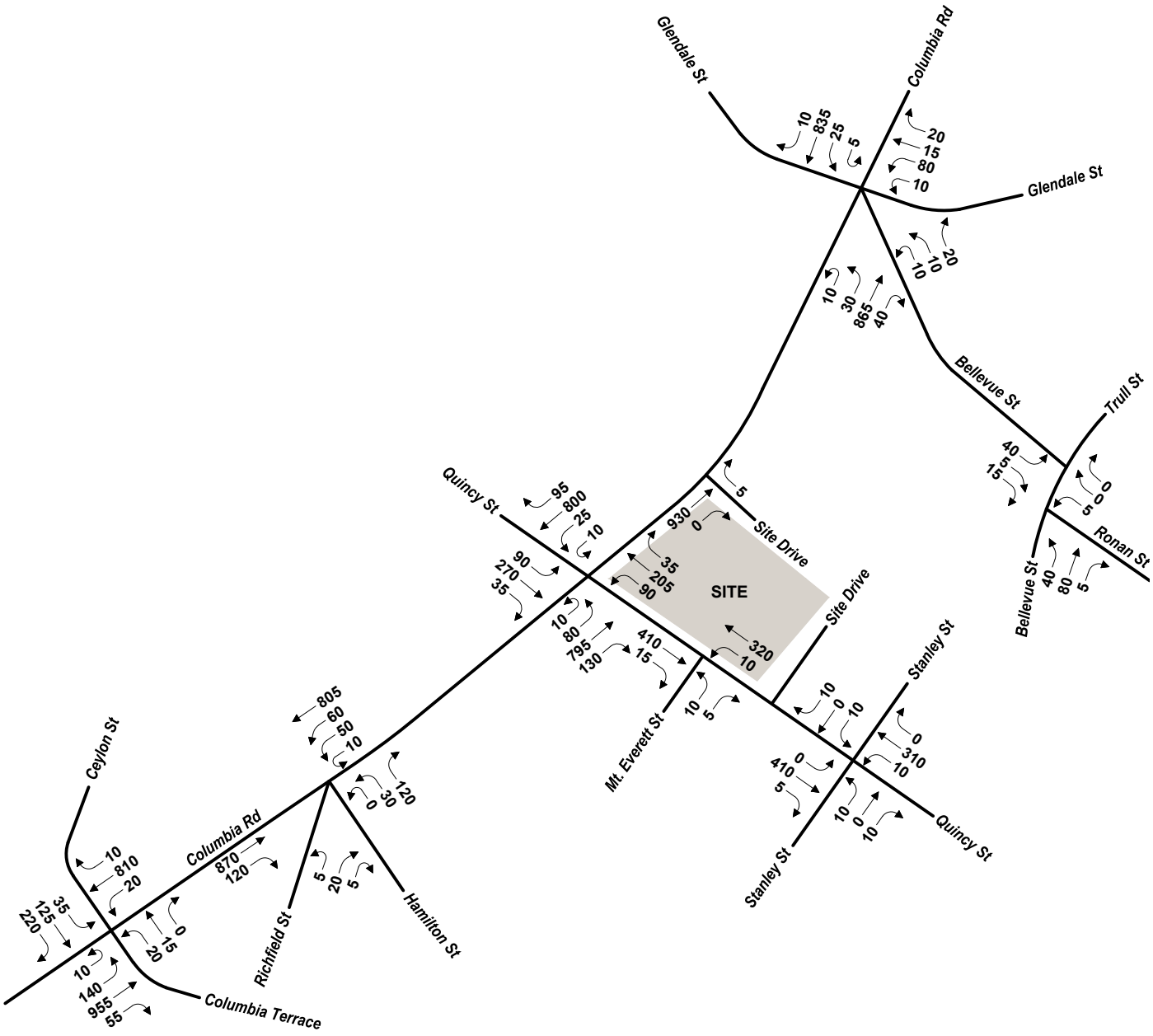
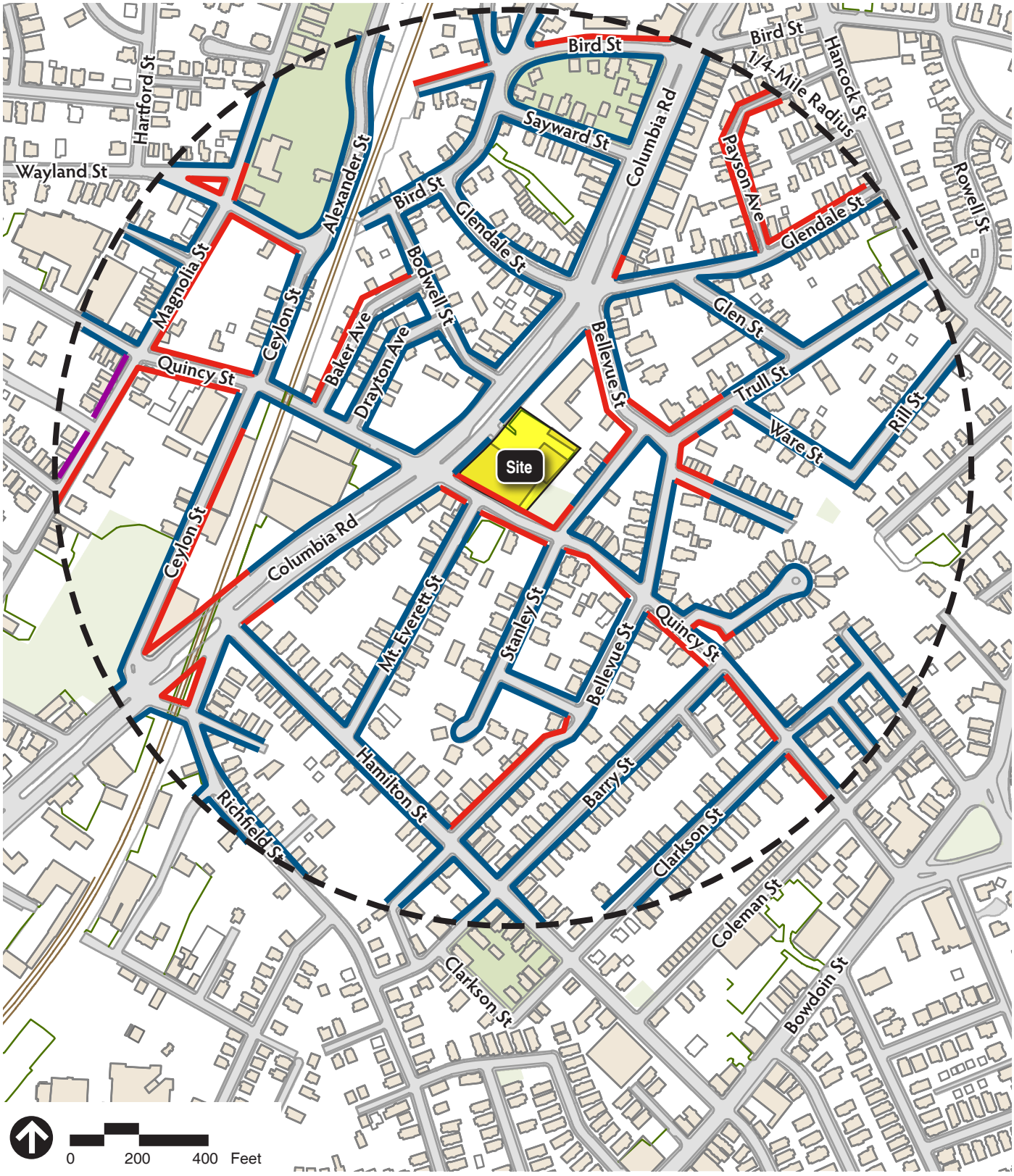


Figure 6

2017 Existing Condition Vehicle Volumes
Evening Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts



Source: MassGIS, City of Boston

HP-DV Plate/Placard Only

Unregulated Parking

No Parking

Figure 7

Study Area Curb Use and On-Street Parking Regulations

Conservatory Lab Charter School
Boston, Massachusetts

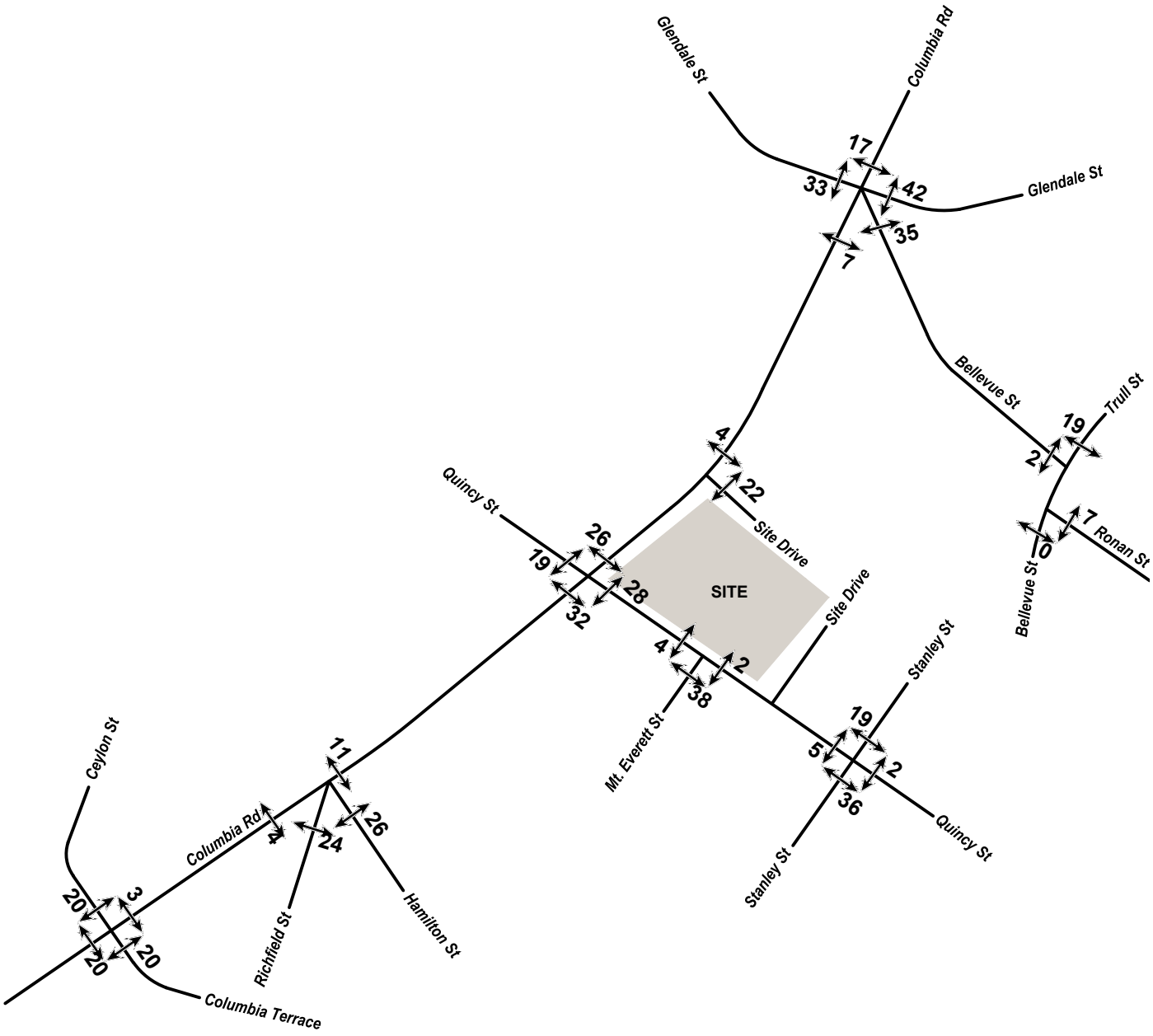


Figure 8

2017 Existing Condition Pedestrian Volumes
Morning Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

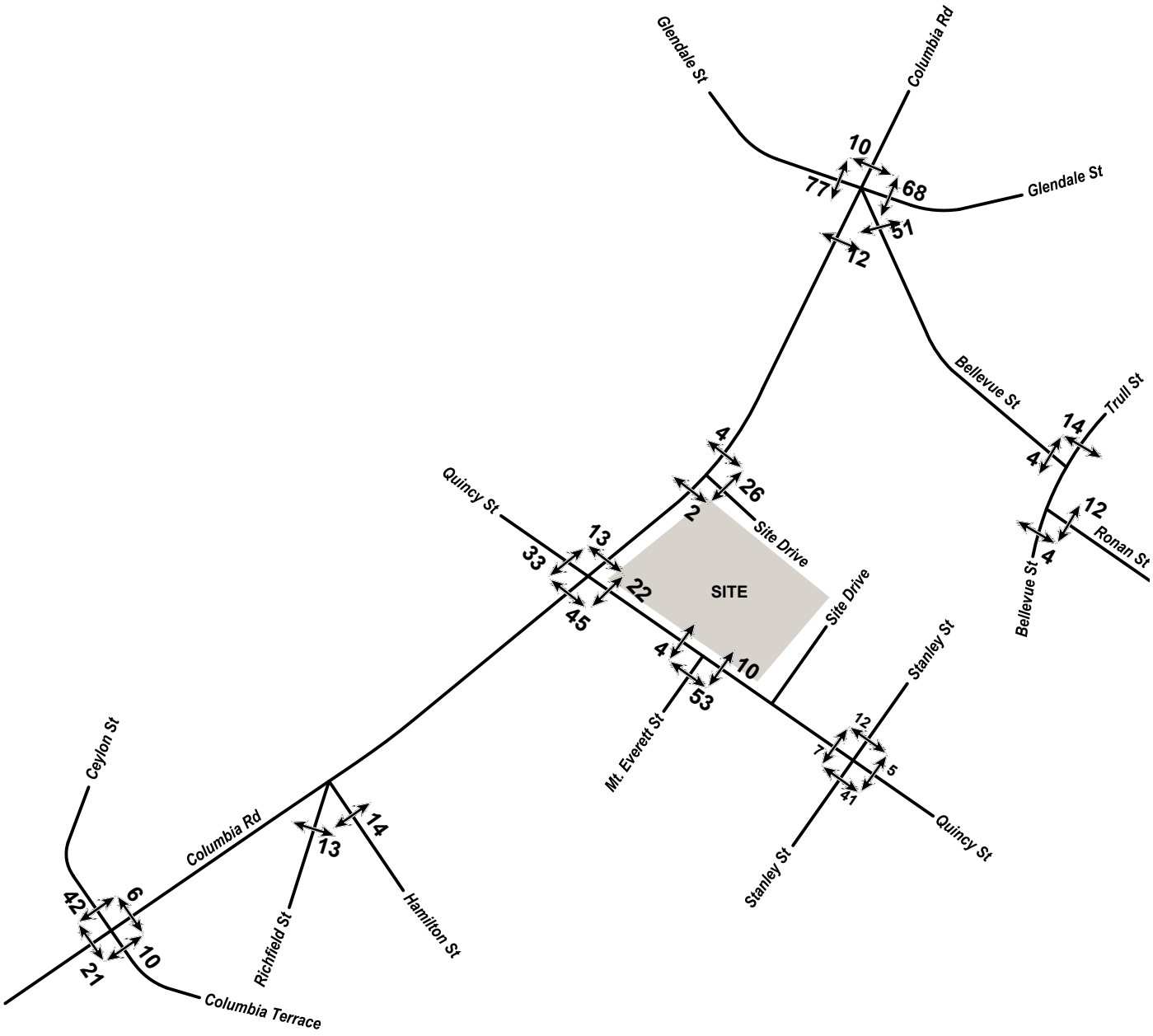


Figure 9

2017 Existing Condition Pedestrian Volumes
Evening Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

Figure 10

2017 Existing Condition Bicycle Volumes
Morning Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

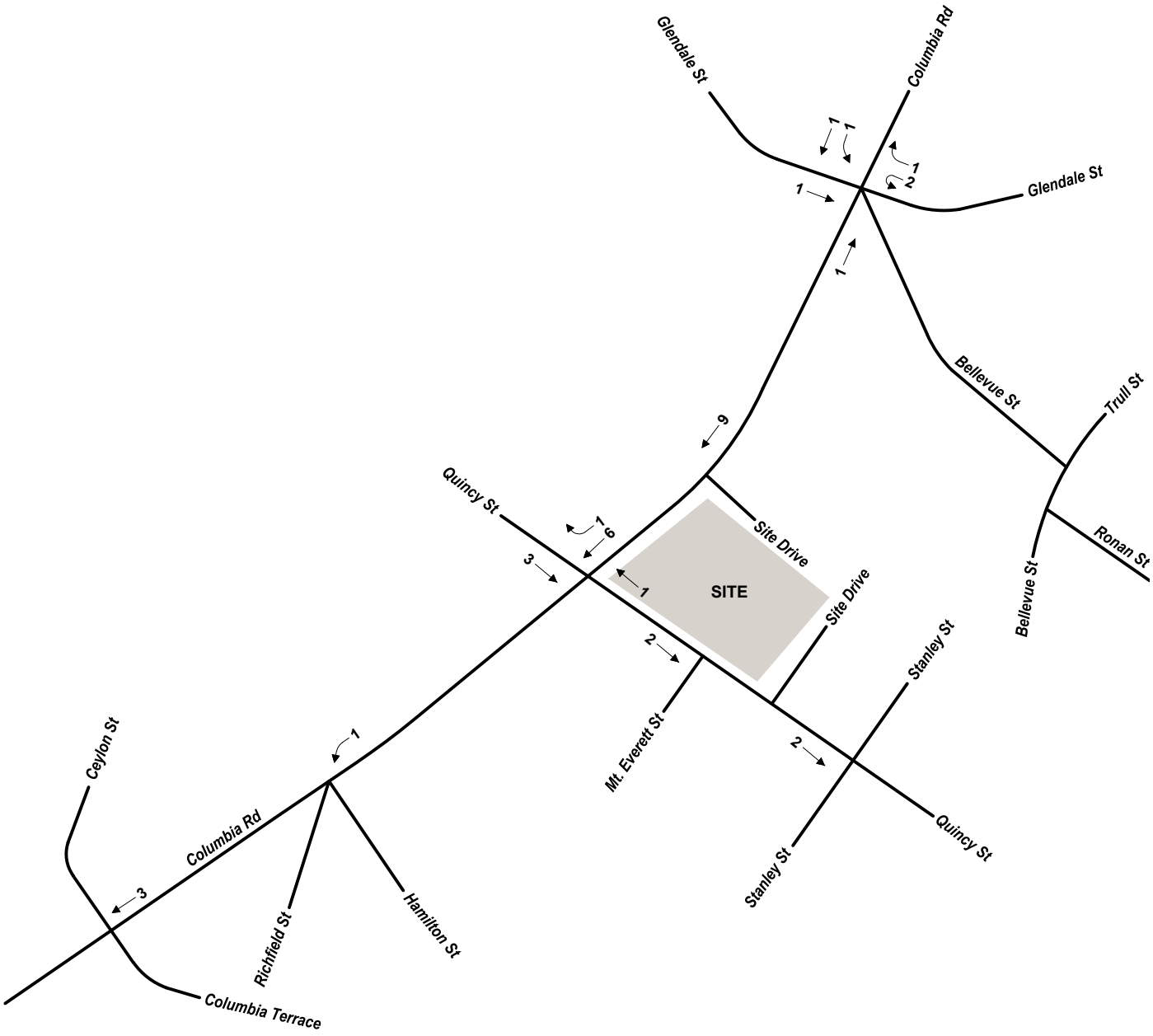
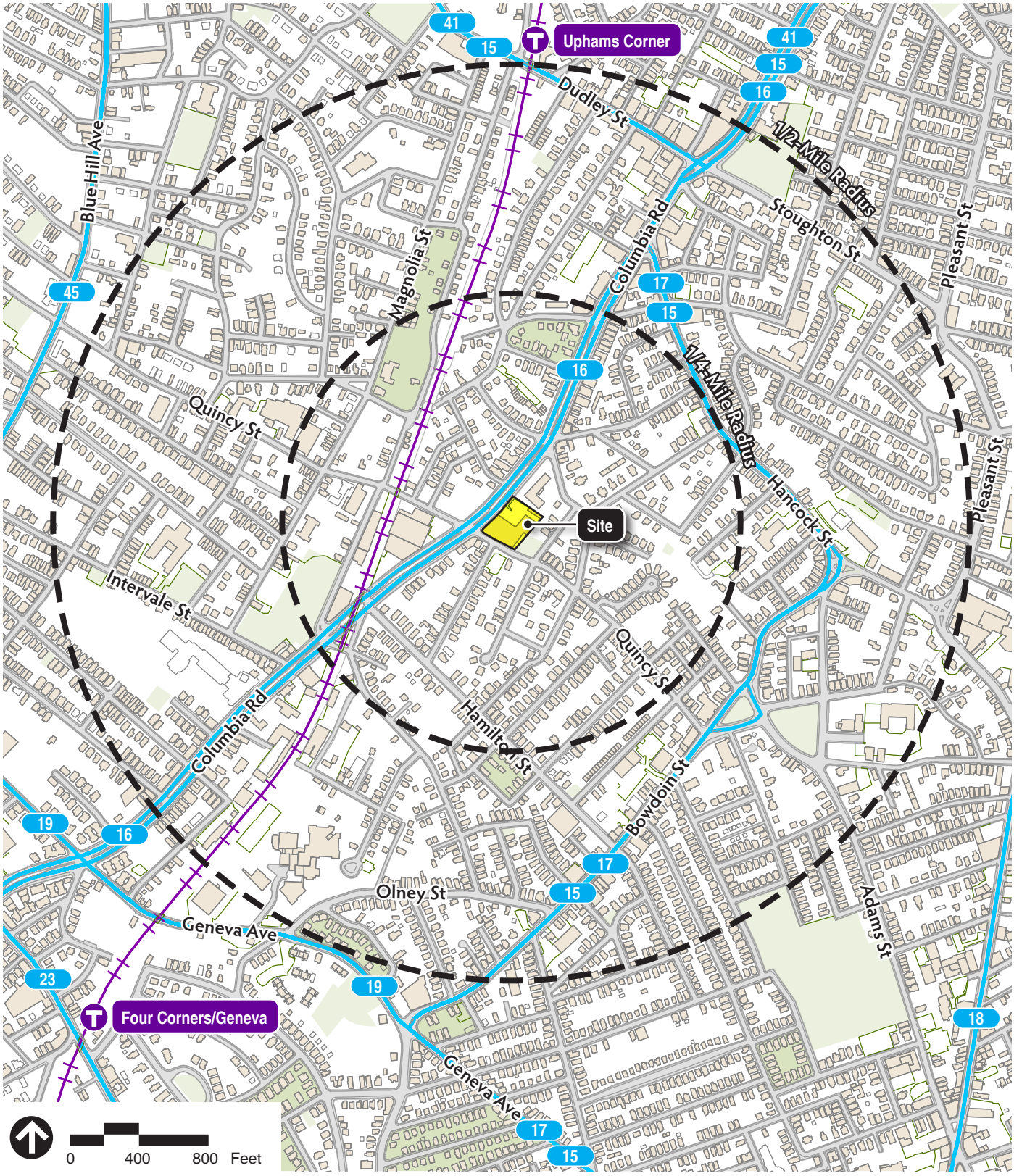


Figure 11

2017 Existing Condition Bicycle Volumes
Evening Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts



Source: MassGIS, City of Boston

MBTA Bus Route

MBTA Commuter Rail

Figure 12

Public Transportation

Conservatory Lab Charter School
Boston, Massachusetts

3

2022 No-Build Condition

Traffic growth within a defined area is a function of expected land development, economic activity, and changes in demographics. General area-wide traffic growth was estimated based on regional traffic growth trends along major study area roadways. The focus of this part of the analysis was to develop and apply an annualized growth rate that could be applied to existing condition peak hour traffic volumes to reasonably account for future traffic growth in the area. A more detailed discussion of the process employed to develop peak hour traffic estimates for the 2022 No-Build Condition is presented below.

3.1 General Background Growth

As mentioned previously, in order to account for general background traffic growth, an annualized growth rate was developed and applied to the existing condition peak hour traffic volumes to reasonably account for future through traffic growth in the study area.

Current trends indicate that Boston experiences an annual growth of about 0.25 percent per year. Due to limited background project data availability, a conservative annual growth rate of 0.5 percent per year for five years was applied to the 2017 Existing Condition. The following projects were considered in this increase:

- **St. Kevin's Redevelopment**, an affordable housing project located on 516-530 Columbia Road.
- **123 Hamilton Street**, a residential project consisting of 52 studios
- **734 Dudley Street**, a mixed-use development consisting of 20 units of residential and 3,000 sq. feet of retail.
- **Bethel Baptist Church**, a worship and community center located on 157 Stanwood Street.
- **191-195 Bowdoin Street**, a mixed-use development consisting of 41 units of residential and 6,000 sq. feet of retail
- **The Clarion**, a mixed-use development consisting of 40 units of residential and 6,000 sq. feet of retail located on 311 Blue Hill Avenue.

The background projects are small developments and therefore it is anticipated that a 0.5 percent annual growth rate will capture all trips associated with them.

Quincy Street Reconstruction

In addition to the vehicle volume growth, the future conditions took into consideration the City's Quincy Street Reconstruction Project. Under this plan, Quincy Street will be reconstruction from Columbia Road to Blue Hill Avenue, altering signal timing plans for the signalized intersection of Quincy Street at Columbia Road during the evening peak hour. The updated timings were incorporated in the 2022 No-Build and Build Conditions.

3.2 2022 No-Build Traffic Volumes

The 2017 Existing Condition volumes were increased to 2022 with a growth rate of 0.5 percent per year to create the 2022 No-Build Condition weekday Morning and Evening peak hour traffic volumes. **Figure 13** and **Figure 14** present the 2022 No-Build Condition traffic volume networks for the weekday morning and evening peak hours, respectively.

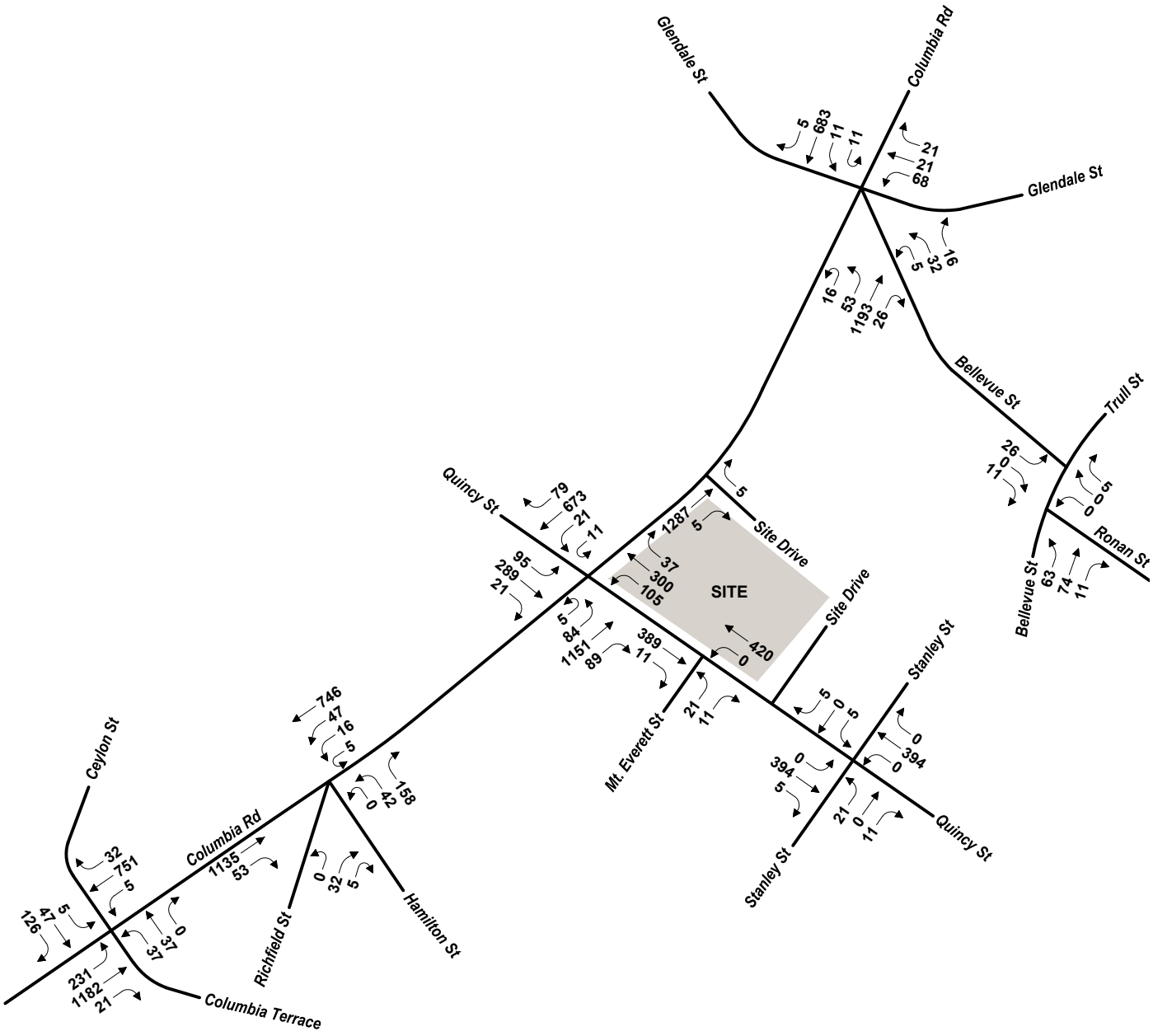


Figure 13

2022 No-Build Condition Vehicle Volumes
Morning Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

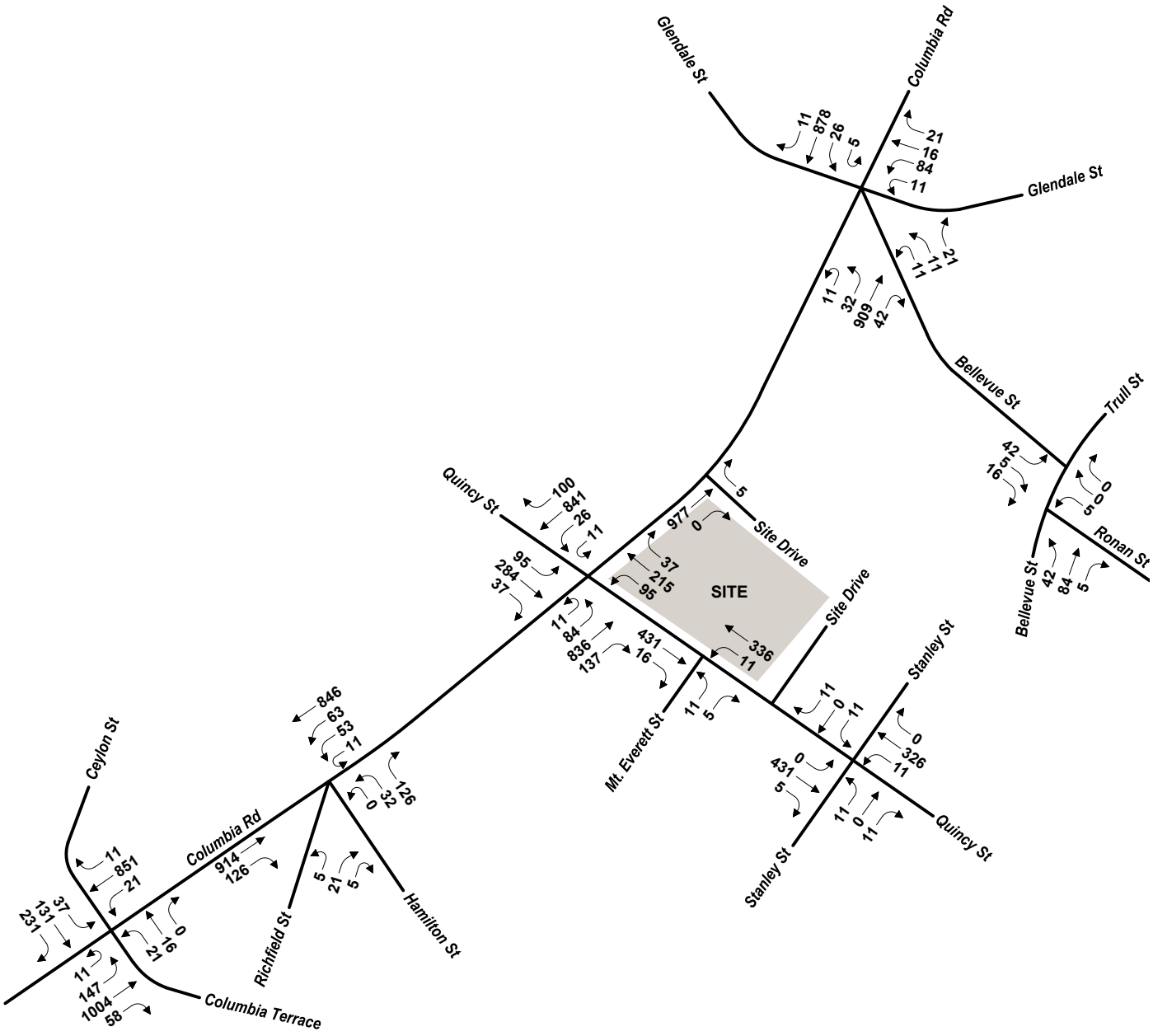


Figure 14

2022 No-Build Condition Vehicle Volumes
Evening Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

4

2022 Build Condition

The 2022 Build Condition traffic volumes were developed by estimating Project-generated traffic volumes, distributing these volumes, and assigning them to the study area network. The traffic volumes expected to be generated by the Proposed Project were added to the 2022 No-Build Condition traffic volumes to create the 2022 Build Condition traffic volume networks. The following sections describe the procedures used to develop the Build Condition traffic volume networks.

4.1 Trip Generation

Project trips were estimated using existing school data for the upcoming 2017-2018 school year and applying these characteristics to the proposed Project. Current student and staff travel patterns were used to determine the number of students taking busses, walking and biking, or being dropped-off/picked-up by a passenger vehicle. **Table 4** identifies the mode shares for students and faculty.

Table 4 Mode Shares

	Students (Grades 3-6)	Students (Grades 7 & 8)	Faculty/Staff
Vehicle	20%	10%	60%
MBTA Bus	5%	80%	35%
Walk/Bike	5%	10%	5%
School Bus	70%	-	-
Total	**100%**	**100%**	**100%**

Source: Current CLCS Students and Faculty transportation conditions

The Institute of Transportation Engineer's (ITE) Trip Generation manual was utilized to determine and quantify expected tripmaking attributable to the Proposed Project. However, the resulting trip estimates from the current student population and their origins provides a more accurate and localized trip generation.

Vehicle trips, broken down by parent drop-off/pick-up, school bus, and faculty/staff, were calculated using the total volume of students and faculty/staff and applying the mode share found at the existing CLCS school. A vehicle occupancy rate (VOR) of 1.2 students/parent vehicle and 1.0 employee/ vehicle was then applied.

CLCS anticipates that at least 10% of the student population, or approximately 28 students, will participate in after school activities. After school activates typically last at least 90 minutes after dismissal and are therefore not included in the evening peak hour volumes. All of these students are required to be picked-up by their parents.

Though faculty/staff typically arrive and depart off-peak, to be conservative, it was assumed that half would arrive during the morning peak hour and depart during the evening peak hour.

Estimated Project-generated vehicle trips for the 2022 Build Condition are shown below in **Table 5**.

Table 5 Estimated Project Generated Trips

	Morning Peak Hour			Evening Peak hour		
	Student	**Faculty**	**Total**	**Student**	**Faculty**	**Total**
Arriving						
School Bus	10	0	10	10	0	10
Vehicle Trip	38	17	55	34	0	34
Total Entering	48	17	65	44	0	44
Departing						
School Bus	10	0	10	10	0	10
Vehicle Trip	38	0	38	34	17	51
Total Exiting	48	0	48	44	17	61

The Proposed Project will generate 112 new vehicle trips (65 entering, 48 exiting) during the morning peak hour and 105 new vehicle trips (44 entering, 61 exiting)

during the evening peak hour. The majority of the trips are parents that will be traveling to CLCS to drop-off and pick-up their children.

4.2 Trip Distribution

Project trips for the 2022 Build Condition were distributed through the study area intersections based on the local trip distribution. Instead of using regional mode shares, trip assignments for the vehicles traveling to the site were determined using the 2017-2018 CLCS Upper School's student enrolment and the facility/staff population residences. This unique data set allows for the development of highly localized and accurate trip distributions for the proposed school.

The school's driveway will operate in a one-way directional loop from Columbia Road to Quincy Street. Left turns from Columbia Road into the Project site are prohibited by a raised median, therefore busses traveling to the site from the north will access the School by turning left into Hancock Street, right onto Bowdoin Street, right onto Quincy Street and finally right onto Columbia Road northbound, from where they'll have access to the site entrance. Vehicles are permitted to execute a U-turn at the intersection of Quincy Street and Columbia Road.

The Project trip distribution is depicted in **Figure 15** and **Figure 16**. The Project generated vehicle trips, presented previously in Table 5, have been assigned to the roadway network using the trip distribution and are presented in **Figures 17 and 18** for the morning and evening peak hours, respectively.

4.3 2022 Build Traffic Volumes

The Project generated trips were added to the 2022 No-Build volumes to develop the 2022 Build Condition peak hour traffic volumes. These volumes are shown in **Figure 19** and **Figure 20** for the morning and evening peak hours, respectively.

4.4 Student Drop-Off/Pick-Up

The Proposed site provides a single drop-off/pick-up area that will be used by both parents and school buses. Access is provided by a one-way, two lane driveway from Columbia Road to Quincy Street. This one-way directionality will allow for busses to drop-off/pick-up directly onto the site sidewalk, while vehicles will drop-off/pick-up onto a painted center pedestrian pathway which will connect to a crosswalk at the school entrance, providing a visible crossing across the bus isle. Faculty and staff members will be monitoring the morning drop-off and afternoon pick-up activities, maintaining a safe environment for the school children.

As indicated in Figure 2, previously presented, the internal driveway has capacity to queue all nine anticipated school busses and up to 17 passenger vehicles within the site in two dedicated drop-off lanes. The active approach CLCS takes with passenger vehicle drop-off and pick-up and the approximately 17 vehicle storage space within the site will eliminate queueing on adjacent public streets. If necessary afternoon

dismissal may be staggered, to support efficient traffic operations in the area. If deemed necessary, students that take the school bus, walk, or take the MBTA busses will be dismissed together. The drive isle has the ability to load all 9 school buses concurrently. Students that are picked-up by their parents will be dismissed 10 minutes later. Parents will be able to use both drive isles.

4.5 Parking

The Project site will provide approximately 43 parking spaces for faculty and staff as well as visitors. The majority of the spaces will be for staff while a small number of spaces near the school entrance will be devoted visitor spaces. The appropriate number of accessible parking spaces will be provided closest to the school entrance.

As indicated in Table 4 approximately 60 percent of faculty and staff will be driving personal vehicles to the site. This equates to approximately 36 faculty/staff vehicles driving to the site, all of which will be accommodated within the 43-space lot. The remaining parking spaces are intended for CLCS visitors.

4.6 Loading and Emergency Vehicles

Loading and service functions for the school will be accommodated within the site along the drive isles. Trash is contained within an easy pull-in/pull-out location near the Columbia Road entrance. The School will work will vendors and the trash collector to ensure deliveries occur off-peak in order to minimize any impacts to the neighborhood roadways and school drop-off/pick-up operations. Minimal deliveries are expected and will be made mostly by delivery vans and a small number of box trucks.

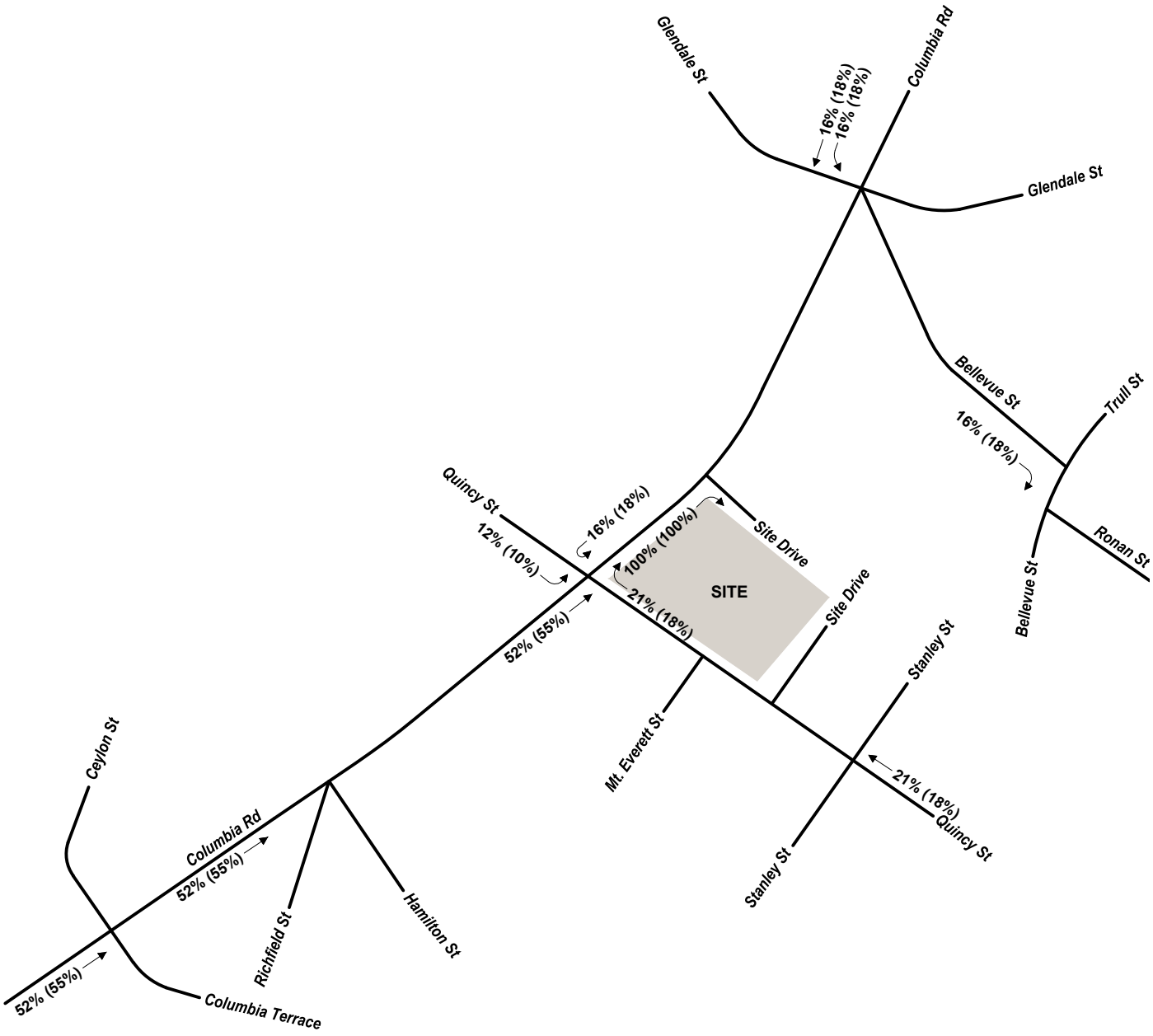
The shared bus drop-off/pick-up lane around the site has been designed to accommodate emergency vehicles.

4.7 Pedestrians and Bicycles

The proposed Quincy Street reconstruction, discussed previously, will upgrade existing sidewalk facilities at the intersection of Quincy Street and Columbia Road. In addition, new pavement markings will be provided, including crosswalks. Sharrows will be added to Quincy Street, west of Columbia Road

With students walking and taking the MBTA to school daily, the Proponent intends to enhance pedestrian facilities into the site. The building will be pulled back along Columbia Road providing an increased sidewalk width along the building edge. All curb cuts into the site will be designed per ADA specifications and crosswalks will be added across both access points. The Proponent intends to provide ample sidewalk space and crosswalks to ensure the safety of the students, faculty/staff, and visitors. The Proponent will provide accessible ramps, crosswalks, and sidewalks throughout the Project site.

Bicycle parking will be provided within the Project site to accommodate the student and faculty riders. Approximately five bicycle racks (10 spaces) will be installed near the school entrance. CLCS will also provide a bike pump and some tools to support minor repairs.



XX%: Student Distribution
(XX): Staff Distribution

Figure 15

Project Generated Trips
Inbound Distribution

Conservatory Lab Charter School
Boston, Massachusetts

XX%: Student Distribution
(XX): Staff Distribution

Figure 16

Project Generated Trips
Outbound Distribution

Conservatory Lab Charter School
Boston, Massachusetts

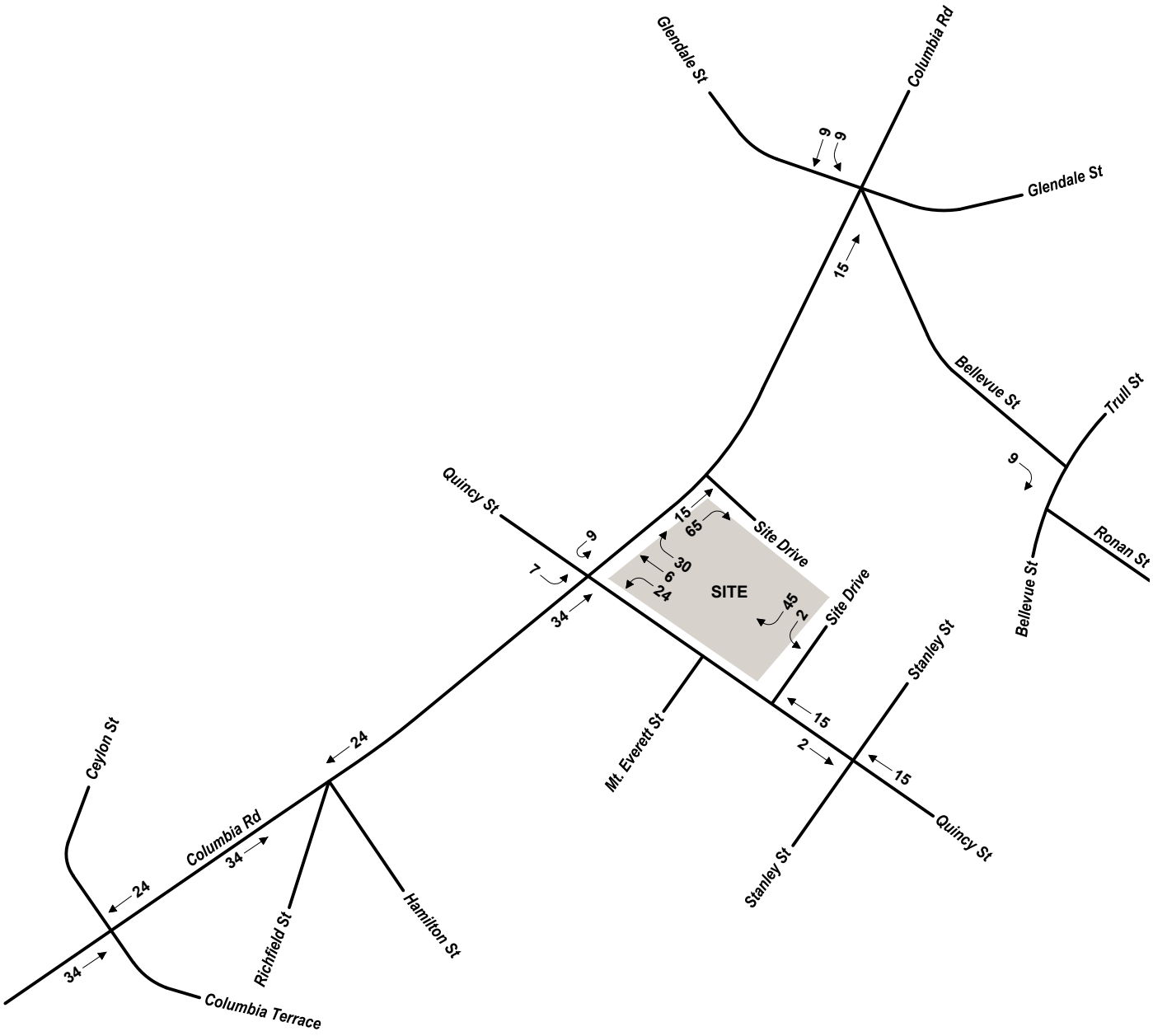


Figure 17

Project Generated Trips
Morning Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

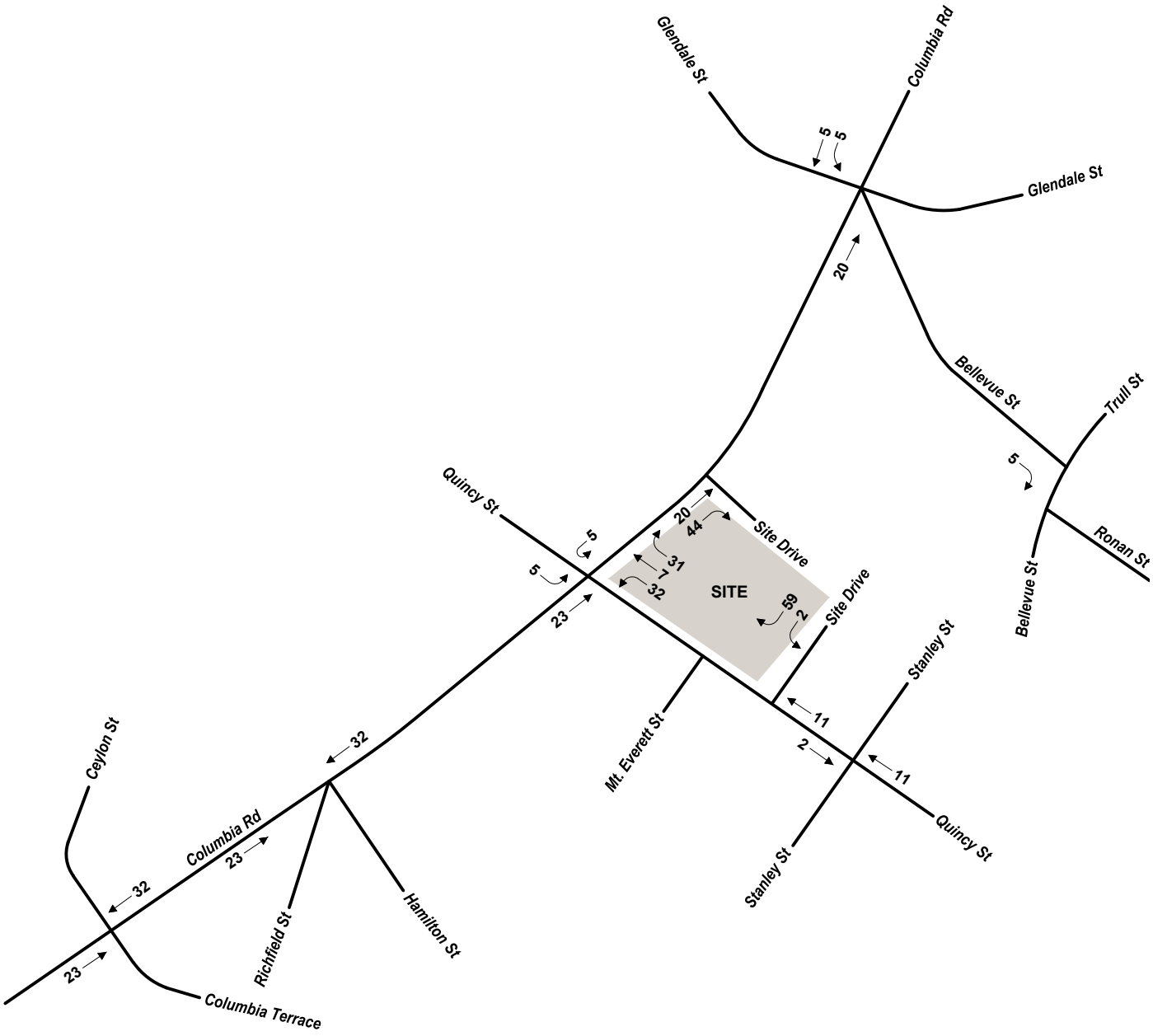


Figure 18

Project Generated Trips
Evening Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

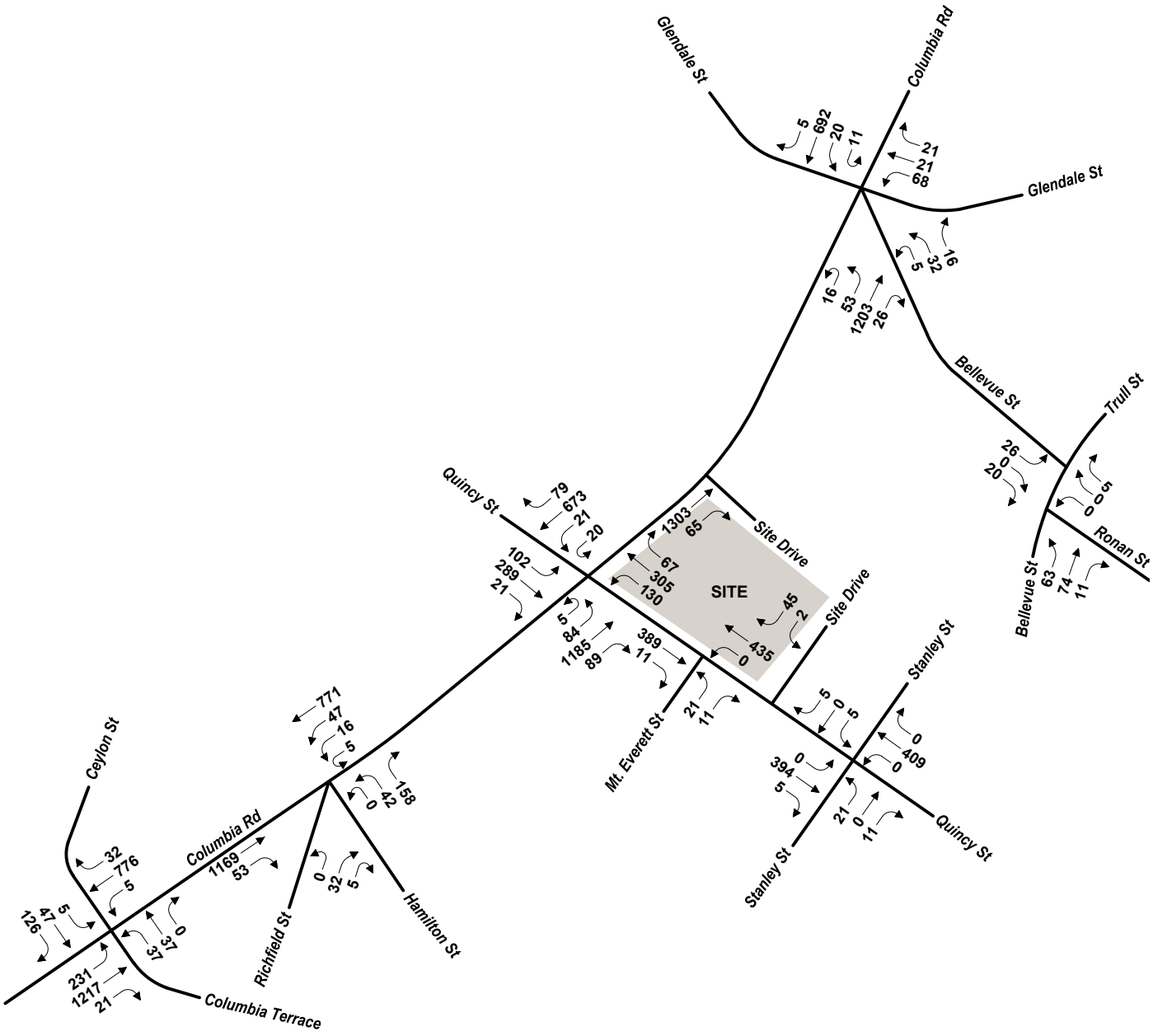


Figure 19

2022 Build Condition Vehicle Volumes
Morning Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

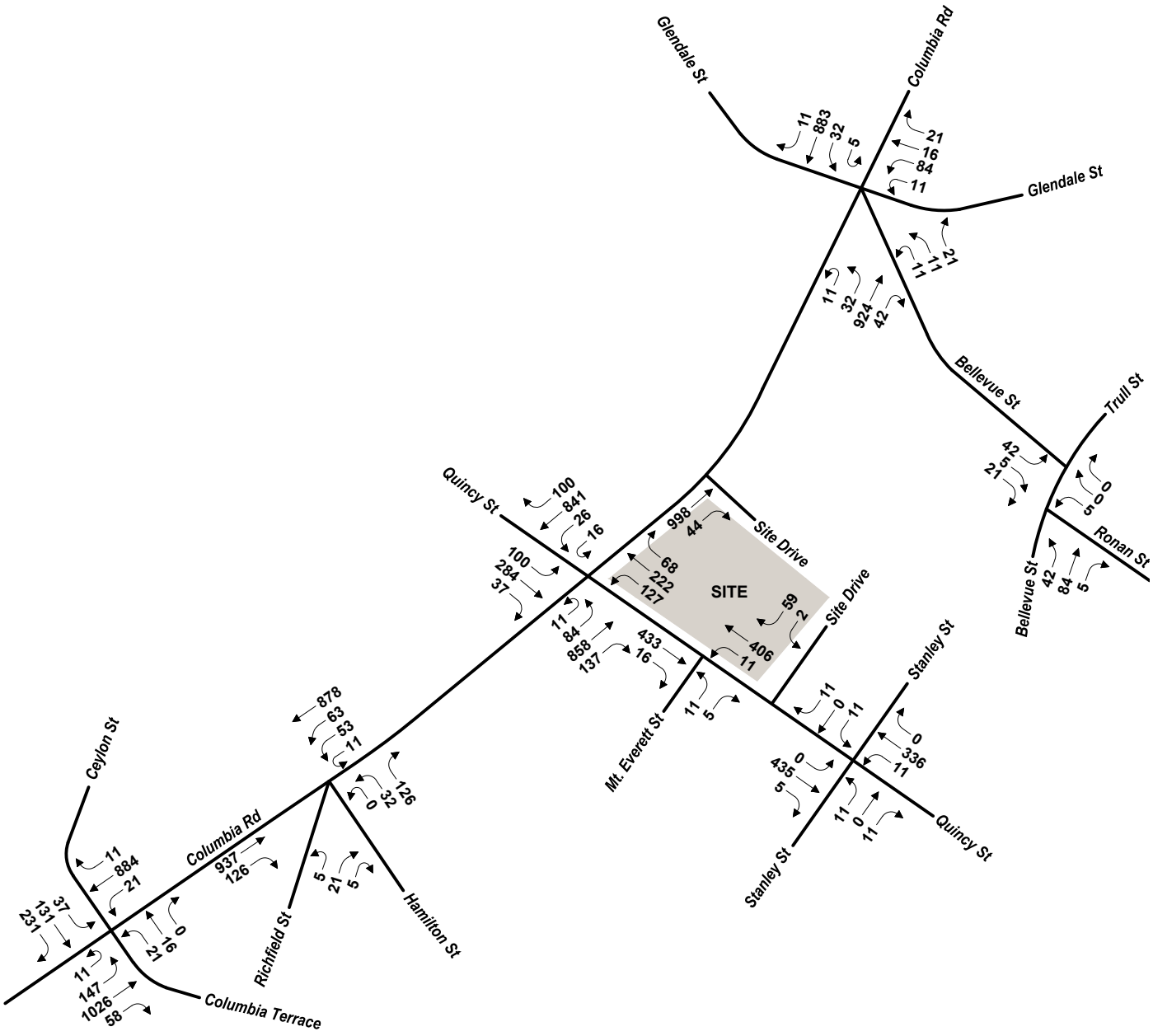


Figure 20

2022 Build Condition Vehicle Volumes
Evening Peak Hour

Conservatory Lab Charter School
Boston, Massachusetts

5

Traffic Operations Analysis

Capacity analyses were conducted for the 2017 Existing, 2022 No-Build, and 2022 Build Conditions to determine how well the roadway facilities serve the existing and future traffic demands. These roadway operating conditions are classified by quantified levels of service as described below.

5.1 Level-of-Service Criteria

Level-of-service (LOS) is a qualitative measure of control delay at an intersection providing an index to the operational qualities of a roadway or intersection. Level-of-service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. For signalized intersections, the analysis considers the operation of each lane or lane group entering the intersection. The LOS designation is for overall conditions at the intersection.

The use of *2010 Highway Capacity Manual* was investigated for the Proposed Project. However, many of the study area intersections were found to be incompatible, therefore, the evaluation criteria used for the LOS analysis are based on the *2000 Highway Capacity Manual* (HCM)[1]. **Table 6** below presents the level of service delay threshold criteria as defined in the HCM.

1 2000 Highway Capacity Manual, Transportation Research Board, Washington D.C. (2000).

Table 6 Level of Service Criteria

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

Source: 2000 HCM

Synchro 9 software was used to model LOS operations at the study area intersections. Detailed Synchro reports are presented in the Appendix.

5.2 Intersection Capacity Analysis

The study area contains eight intersections analyzed under 2017 Existing, 2022 No-Build, and 2022 Build Conditions. **Tables 7 and 8** presents a summary of the signalized and unsignalized intersection capacity analysis., detailed LOS tables including individual approaches and queues are included in the Appendix.

Table 7 Signalized Intersection Capacity Analysis Summary

		2017 Existing Condition			2022 No-Build Condition			2022 Build Condition		
Location	**Period**	**V/C[1]**	**Delay[2]**	**LOS[3]**	**V/C**	**Delay**	**LOS**	**V/C**	**Delay**	**LOS**
Columbia Road/ Ceylon Street/ Columbia Terrace	Weekday Morning	0.83	41.4	D	0.90	48.0	D	0.92	49.8	D
	Weekday Evening	0.89	75.2	E	0.93	89.2	F	0.94	95.0	F
Columbia Road/ Quincy Street	Weekday Morning	1.45	73.7	E	1.52	89.6	F	1.61	115.5	F
	Weekday Evening	1.48	70.8	E	1.37	53.9	D	1.42	63.0	E
Columbia Road/ Glendale Street/ Bellevue Street	Weekday Morning	0.87	112.4	F	0.93	134.8	F	0.93	137.7	F
	Weekday Evening	0.68	45.2	D	0.74	61.4	E	0.75	64.4	E

V/C = volume to capacity ratio
Delay = Average delay in seconds per vehicle
LOS = Level of Service

Table 8 Unsignalized Intersection Capacity Analysis Summary

Location	Period	2017 Existing Condition			2022 No-Build Condition			2022 Build Condition		
		V/C[1]	Delay[2]	LOS[3]	V/C	Delay	LOS	V/C	Delay	LOS
Columbia Road/ Hamilton Street/ Richfield Street	Weekday Morning	0.45	18.5	C	0.54	23.1	C	0.55	24.4	C
	Weekday Evening	0.29	12.8	B	0.29	12.5	B	0.29	12.5	B
Columbia Road/ Site Driveway	Weekday Morning	0.02	12.0	B	0.02	12.0	B	0.09	11.9	B
	Weekday Evening	0.02	9.6	A	0.02	10.0	B	0.10	11.3	B
Bellevue Street / Ronan Street	Weekday Morning	0.01	9.1	A	0.01	9.1	A	0.01	9.1	A
	Weekday Evening	0.01	9.8	A	0.01	9.8	A	0.01	9.9	A
Stanley Street/ Quincy Street	Weekday Morning	0.19	21.8	C	0.21	23.6	C	0.22	24.3	C
	Weekday Evening	0.09	18.6	C	0.10	19.8	C	0.11	20.2	C
Quincy Street/ Mt. Everett Street	Weekday Morning	0.12	18.4	C	0.13	19.5	C	0.15	21.3	C
	Weekday Evening	0.07	17.7	C	0.08	18.8	C	0.09	20.7	C

V/C = volume to capacity ratio
Delay = Average delay in seconds per vehicle
LOS = Level of Service

As shown in the summary tables above, all study area intersections maintain their same LOS under Existing, No-Build, and Build except for three intersections, with only one intersection being impacted directly by the Project. These intersections are described below:

Columbia Road/Ceylon Street/Columbia Terrace, under 2017 Existing Conditions, operates at LOS E in the evening peak hour and decreases to LOS F under 2022 No-Build Condition due to the background regional growth. There is no change in LOS from the No-Build Condition to the Build Condition. During the AM peak this intersection operates at an acceptable LOS D across all three conditions.

Columbia Road/Quincy Street, under 2017 Existing Conditions, operates at LOS E in the morning peak hour and decreases to LOS F under the 2022 No-Build Condition. Although there is no change in LOS from the No-Build Condition to the Build Condition, the Project is estimated to add approximately 25 seconds of delay. During the evening peak hour, this intersection will operate at LOS E during the 2017 Existing Conditions and improves to LOS D under the No-Build Condition due to the signal retiming associated with the City's Quincy Street Reconstruction Project. Under 2022 Build Conditions, the Project trips will cause the intersection to fall back

to LOS E operations, although less overall intersection delay than under Existing Conditions.

Columbia Road/ Glendale Street/ Bellevue Street operates at LOS F during 2017 Existing morning peak hour Conditions and does not change in operations during No-Build or Build Conditions. Under evening peak conditions, the intersection operates at LOS D for Existing Conditions and decreases to LOS E in the 2022 No-Build Conditions. There is no change in LOS from the No-Build condition to the 2022 Build condition.

The LOS analysis indicates that the Project has limited impacts to the surrounding study area intersections. The Project does have a slight impact to the Columbia Road and Quincy Street intersection due to the increased traffic circulating around this intersection during the evening peak hour. This intersection is being updated through the Quincy Street Reconstruction Project with improved signal timings. The Proponent will work with the City on improving operations at this intersection through possible timing adjustments that could be updated through the City's project. Additionally, note that the actual traffic impacts generated by CLCS during morning school arrival times will generally occur after the end of the morning peak commuter period (and will be lower than that represented herein). In an effort to be conservative, this study has applied those anticipated traffic volumes to coincide with the peak to quantify and measure a worst-case condition. In addition, as described in greater detail below, CLCS implements a robust transportation demand management program, emphasizing sustainable modes and reducing the use of vehicles. The Proponent will also work with the students and parents to provide the best bus service to serve the greatest number of students. This will also help reduce the number of vehicle trips to the site and could further minimize the Project's impact on the surrounding roadway network.

5.3 Project Mitigation

As indicated in the intersection capacity analysis, the Project does have an impact to the operations of the Columbia Road/Quincy Street intersection. This intersection is being improved through the City's Quincy Street Reconstruction Project with improved evening signal timings., By applying similar retiming strategies to the morning peak hour, significant improvement could be made to the overall delay experienced at this intersection. Reallocating more time for the Quincy eastbound and westbound movements could reduce overall intersection delays by more than 15 seconds. Alternatively, existing volume trends indicate that a new phasing scheme providing a protected left turn phase for vehicles travelling northbound on Columbia Road could reduce delay significantly. **Table 9** presents a summary of the proposed mitigation strategies at the intersection of Columbia Road and Quincy Street

Table 9 Mitigated Signalized Intersection Capacity Analysis Summary

		2022 Build Condition			2022 Build Condition - Retimed			2022 Build Condition - Rephased		
Location	**Period**	**V/C[1]**	**Delay[2]**	**LOS[3]**	**V/C**	**Delay**	**LOS**	**V/C**	**Delay**	**LOS**
Columbia Road/ Quincy Street	Weekday Morning	1.61	115.5	F	1.55	98.1	F	1.17	62.7	E

1. V/C = volume to capacity ratio
2. Delay = Average delay in seconds per vehicle
3. LOS = Level of Service

As shown in the summary table, relatively inexpensive retiming or rephasing can have significant positive impacts at this intersection. Retiming the intersection by allocating more time to the Quincy Street eastbound and westbound movement reduced overall intersection delay by about 17 seconds, just eight seconds more than in the 2022 No-Build Condition. Rephasing the intersection and allocating time for a protected northbound left turn phase instead of the current southbound left turn phase reduced the delay even further, to about 63 seconds. The rephasing option would have to be further investigated to ensure its effectiveness in the evening peak hour, but current vehicle volumes indicate there is higher northbound left turn demand than southbound left turn demand in the evening as in the morning.

The Proponent will work with BTD on potential mitigation strategies, including potential signal retiming and rephrasing at the intersection of Quincy Street and Columbia Road.

6

Transportation Improvements

This section delineates the transportation improvements plan developed by the Proponent in connection with the Proposed Project. In addition to physical improvements, the Proponent proposes to minimize reliance on travel by automobile through implementation of a proactive Traffic Demand Management (TDM) plan. Generally, TDM strategies are most effective with commuter travel where most trips are made by employees (e.g. in an office development). However, there are a number of measures that will be implemented in an effort to reduce faculty/staff auto trips.

6.1 Area Improvements

CLCS is proposing minimal improvements to the surrounding area due to the limited Project impact and overall good condition of area roadways and sidewalks. CLCS is committed to include reconstructing the sidewalk along Columbia Road, and providing accessible connections from the Project site to Columbia Road and Quincy Street.

6.2 Transportation Demand Management

The goal of the Transportation Demand Management plan is to reduce the Project's overall traffic impact through the implementation of TDM measures that are geared toward affecting the demand side of the transportation equation, rather than the supply side. By their very nature, TDM programs attempt to change people's

behavior, and, to be successful, they must rely on incentives or disincentives to make these shifts in behavior attractive to the commuter[2].

TDM programs are designed to maximize the people-moving capability of the existing transportation infrastructure by increasing the number of persons in a vehicle, providing alternate modes of travel, or influencing the time of, or need to, travel.

TDM measures are most often directed at commuter travel, characterized by the day-to-day regularity of this type of trip. Conditions at the workplace, in terms of employer practices such as on-site services, bicycle storage, shower facilities and shuttle services, impact faculty and staff commuter choices, and makes this market the most suitable for identifying alternatives.

The term TDM encompasses both alternatives to driving alone and the techniques or supporting strategies that encourage the use of these alternatives. TDM alternatives to driving alone include carpools and vanpools, public and private transit, and non-motorized travel including bicycling and walking.

TDM strategies are the supporting measures that encourage the use of alternatives to driving alone. TDM strategies include financial incentives, time incentives, provision of new or enhanced commuter services, dissemination of information, and marketing alternative services. TDM strategies include all the incentives and disincentives that increase the likelihood for people to change their existing travel behavior.

Transportation Demand Management Plan

To implement a TDM program for the Proposed Project, the Proponent will consider a number of measures that will contribute toward the reduction of vehicular traffic to and from the Project site.

The following measures could comprise the proposed TDM package.

Ridesharing

The Proponent will promote ridesharing for its faculty and staff by carpooling. The Proponent will provide information regarding carpooling and its benefits to faculty and staff. CLCS will consider providing ridesharing vehicles with preferential parking spaces in the parking lots as a rideshare incentive.

2 Implementing Effective Traffic Demand Management Measures: Inventory of Measures and Synthesis of Experience, prepared by Comsis Corporation and the Institute of Transportation Engineers, for the U.S. Department of Transportation, DOT-T-94-02, September 1993, p. I-1.

Transportation Coordinator

A transportation coordinator will be identified to ensure that the complete rideshare program, including ride matching, promotion, incentives and a guaranteed ride home, is consistently promoted and provided.

Guaranteed Ride Home

In the event of an emergency or a request to stay late at work, the guaranteed ride home would allow faculty and staff to receive transportation service home, usually in the form of a taxi. This program helps to alleviate commuter's worries about being stuck on-campus when using alternative modes in case of various family emergencies.

Transit Incentives

To encourage the use of transit by faculty and staff to commute to work, CLCS will provide local bus schedule and route information in the faculty/staff areas. In addition, the school will offer monthly pre-tax MBTA pass sales for faculty/staff to promote the use of public transportation.

Bicycle and Pedestrian Measures

Bicycling to the site will likely be attractive to some faculty/staff due to the proximity of many residential communities. To encourage and facilitate use of bicycles by faculty/staff, both secure/covered and outdoor bicycle storage racks will be provided at the new school.

Again, due to the close proximity of residential areas to the site, walking will be attractive to some students and faculty/staff. The Proponent is committed to maintain sidewalks on and around the site. Safe on-site pedestrian circulation will be promoted through clearly delineated crosswalks/walkways on-site. All constructed pedestrian facilities will be ADA compliant.

7

Construction Management

Following the Article 80 review process, a detailed Construction Management Plan (CMP) will be developed and submitted to the BTD for its approval in connection with the Proposed Project. The CMP will provide a detailed evaluation of potential short-term construction related transportation impacts during the course of the Proposed Project's construction. The CMP will include truck routing, construction staging on-site, and pedestrian circulation around the site.

Construction vehicles will be necessary to move construction materials to and from the Proposed Project site. The Proponent recognizes that construction traffic is a concern to area residents. No roadway closures are anticipated with the construction project. The need for street occupancy (i.e. temporary removal of parking or single lane closures) along roadways adjacent to the Proposed Project site is possible during certain periods of construction.

Contractors will be required to devise access plans for their personnel that de-emphasizes auto use (such as seeking off-site parking, provide transit subsidies, etc.). The following are some of the elements that are anticipated to be included in a forthcoming CMP to support the Project:

- The vehicular access to the Project site during the construction period will be from Columbia Road.
- The construction site will be maintained on private property and will likely not require long-term roadway and/or sidewalk occupancies (other than for utilities connections etc.).
- Staging areas for construction are anticipated to be located directly on the Project site.