

75 New Street Residential Development

Cambridge,
Massachusetts

Submitted to: City of Cambridge
Traffic, Parking and Transportation Department

Submitted by: AbodeZ Development

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August 5, 2013

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Introduction & Project Overview

On behalf of AbodeZ Development (the project proponent), Vanasse Hangen Brustlin, Inc. (VHB) has conducted a Transportation Impact Study (TIS) for redevelopment of the parcel located at 75 New Street, north of the Sozio Rotary in Cambridge, Massachusetts. The proposed development includes a residential building with 93 apartment units and 93 parking spaces and four additional short-term spaces.

This TIS responds to the scope dated July 9, 2013 defined by the City of Cambridge TP&T Department. A copy of the City's scoping letter is included in the Appendix. The TIS has been prepared in conformance with the current City of Cambridge *Guidelines for Transportation Impact Study* required under the Article 19 Special Permit Project Review. The TIS document comprises three components, as follows:

- *Project Overview*, describing the transportation characteristics of the proposed project and presenting the required Planning Board Criteria Performance Summary sheets;
- *Transportation Impact Study*, presenting the technical information and analysis results as required under the guidelines; and,
- *Planning Board Special Permit Criteria*, summarizing the evaluation of the proposed project as defined under the guidelines.

Supplementary data and analysis worksheets are provided in a technical appendix. Electronic files for automatic traffic recorder (ATR) counts, turning movement counts (TMC), and Synchro and Sidra analyses are also provided on an accompanying CD.



Project Overview

The project is located on the west side of New Street, opposite of Danehy Park, in north-western Cambridge. The parcel is currently occupied by the J&C Adams Warehouse facility and abuts the south side of the 87 New Street residential development known as Park87.

The Project comprises 93 residential apartment units and 93 parking spaces (with four additional short-term spaces). To accommodate the development, the proponent proposes to demolish the existing 30,000 SF J&C Adams building. The existing parking lot, which contains 31 spaces, will be eliminated.

Both the project site and the adjacent Park87 Residences parcel are owned by the proponent. The project site is illustrated in the following plans:

- **Figure A** presents a site location map
- **Figure B** presents an aerial view of the proposed site and its neighborhood context
- **Figure C** presents the existing site plan

Currently, the project site has two curb cuts/vehicular access points on New Street. With the proposed development, these existing curb cuts will be reduced in size and utilized to provide vehicular access to the site. The southern curb cut on New Street will provide access to the parking area while the northern curb cut will provide egress for a one-way drop-off/pick-up loop and four short-term parking spaces. The entrance to the drop-off/pick-up loop will be provided via the shared driveway to 87 New Street. The proposed site plan is presented in **Figure D**.

The proposed project program is summarized in **Table A** below.

Table A
Proposed Development Program

Use	Size
Residential (Apartments)	93 units
Vehicle Parking	93 spaces (+ 4 short-term spaces)
Bicycle Parking	98 spaces (+ 10 short-term spaces)

A total of 93 vehicle parking spaces will be provided for the residences as shown in **Figure E**. Of these spaces, 69 will be located in a secure, basement level garage accessed via a vehicle ramp, while 24 spaces will be provided at ground level



outside. Four additional short-term spaces will be provided in the pick-up/drop-off loop.

Long-term secured bicycle parking will be provided in the parking garage in two separate bike rooms as illustrated in **Figure F**. One bike room will contain 48 spaces while the other bike room will provide 50 spaces. The 1.05 ratio of sheltered bicycle spaces per residential unit meets the current zoning requirements. An additional 10 short-term bike parking spaces will be provided near the entrance of the building in accordance with zoning requirements.

The TIS study area for the proposed project, as defined by the City of Cambridge, is shown in **Figure G**.



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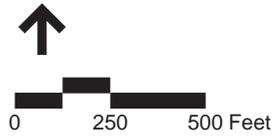


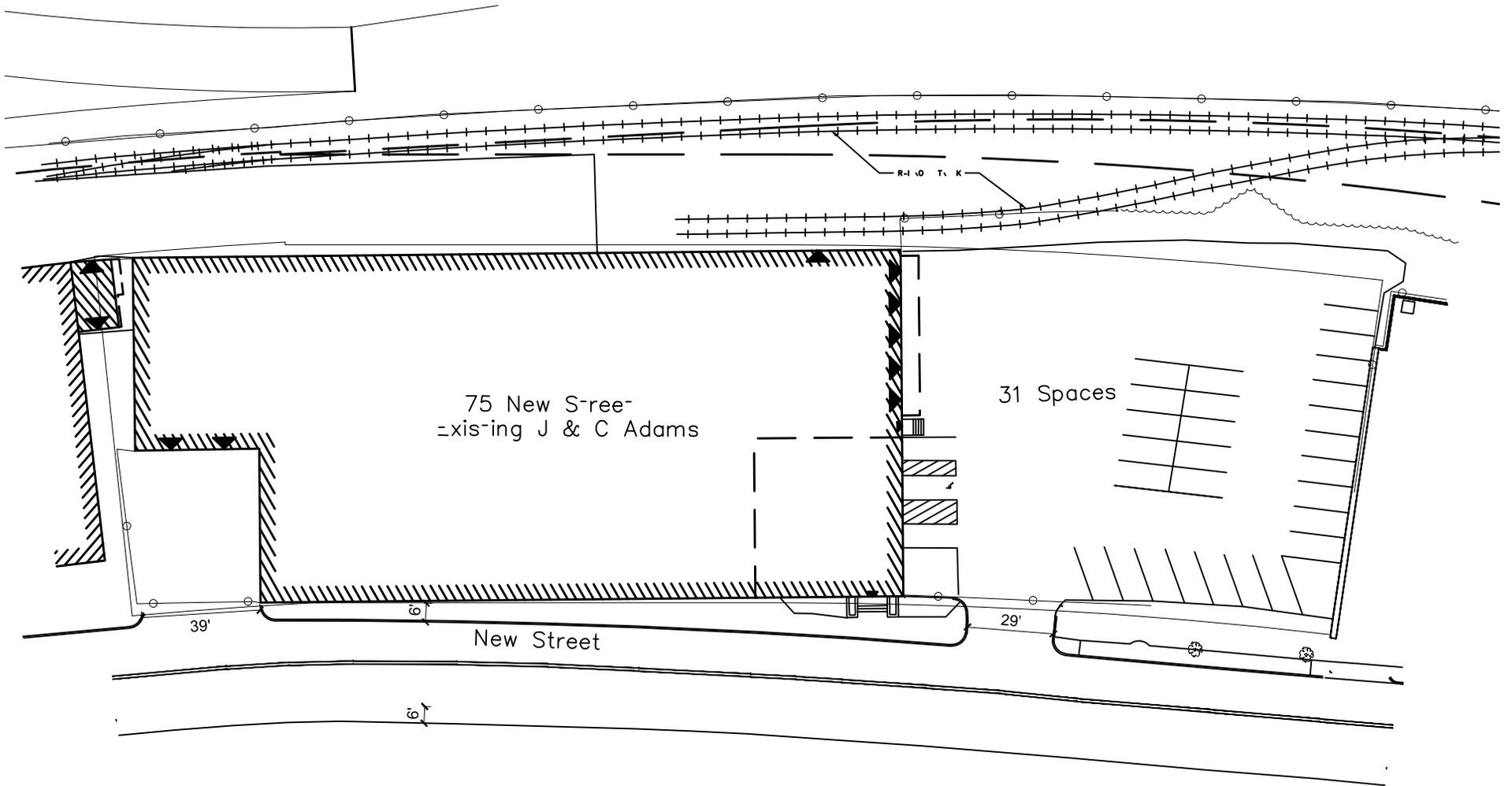


Vanasse Hangen Brustlin, Inc.

Figure B
Neighborhood Context

75 New Street Residences
Cambridge, Massachusetts

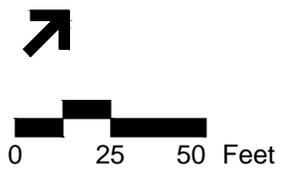


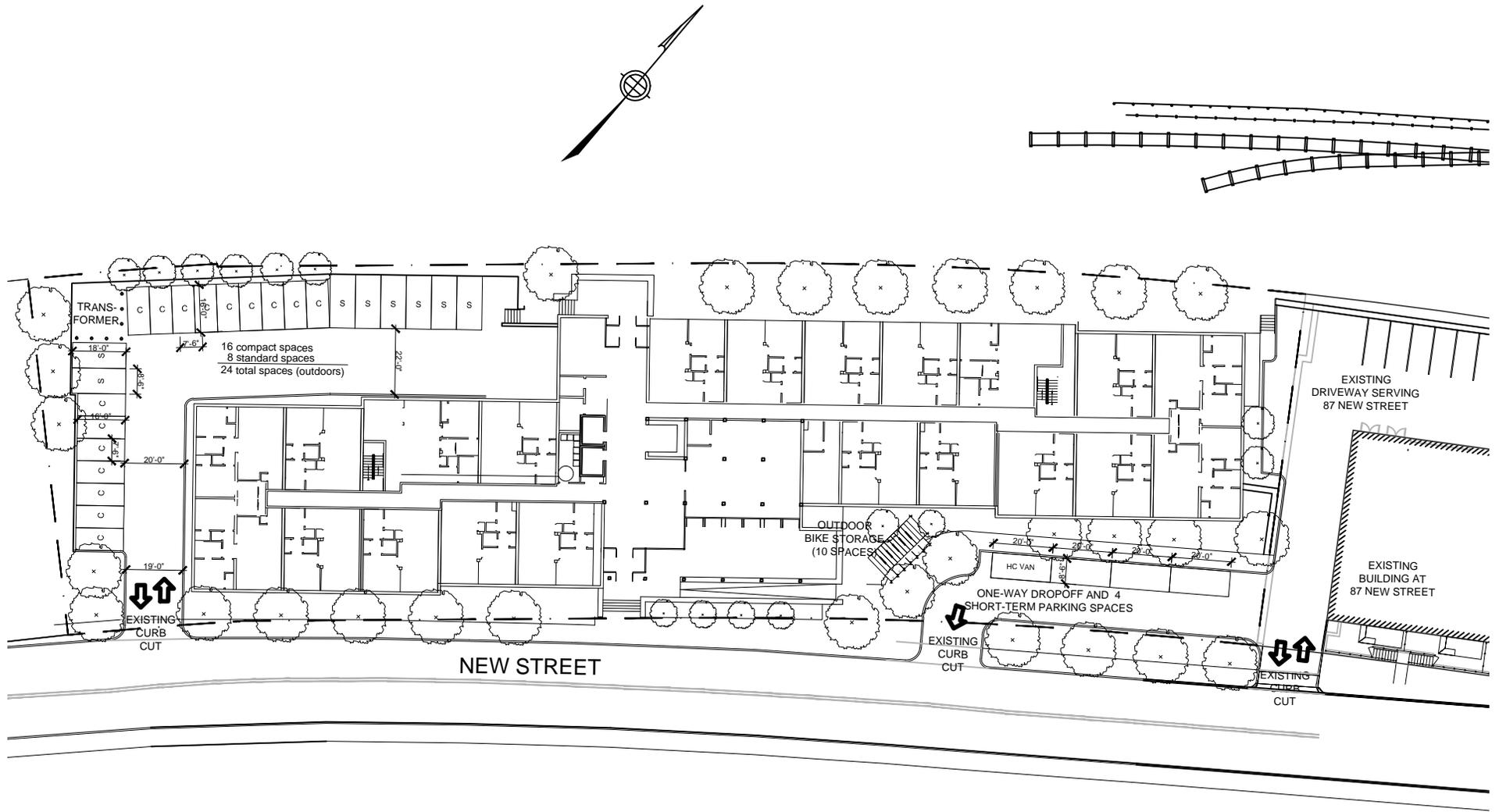


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Figure C
Existing Site Plan

75 New Street Residences
Cambridge, Massachusetts



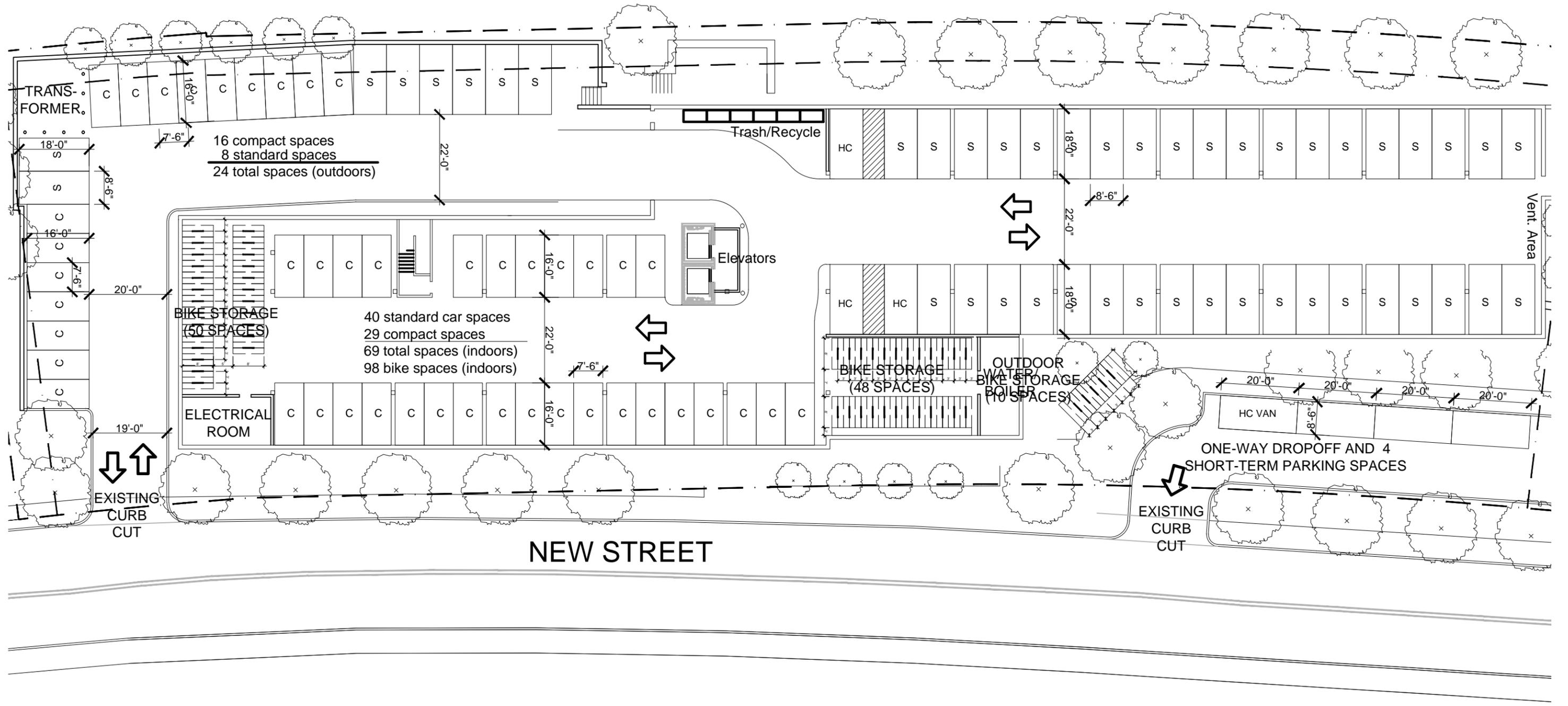


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Figure D
Proposed Site Plan

75 New Street Residences
Cambridge, Massachusetts

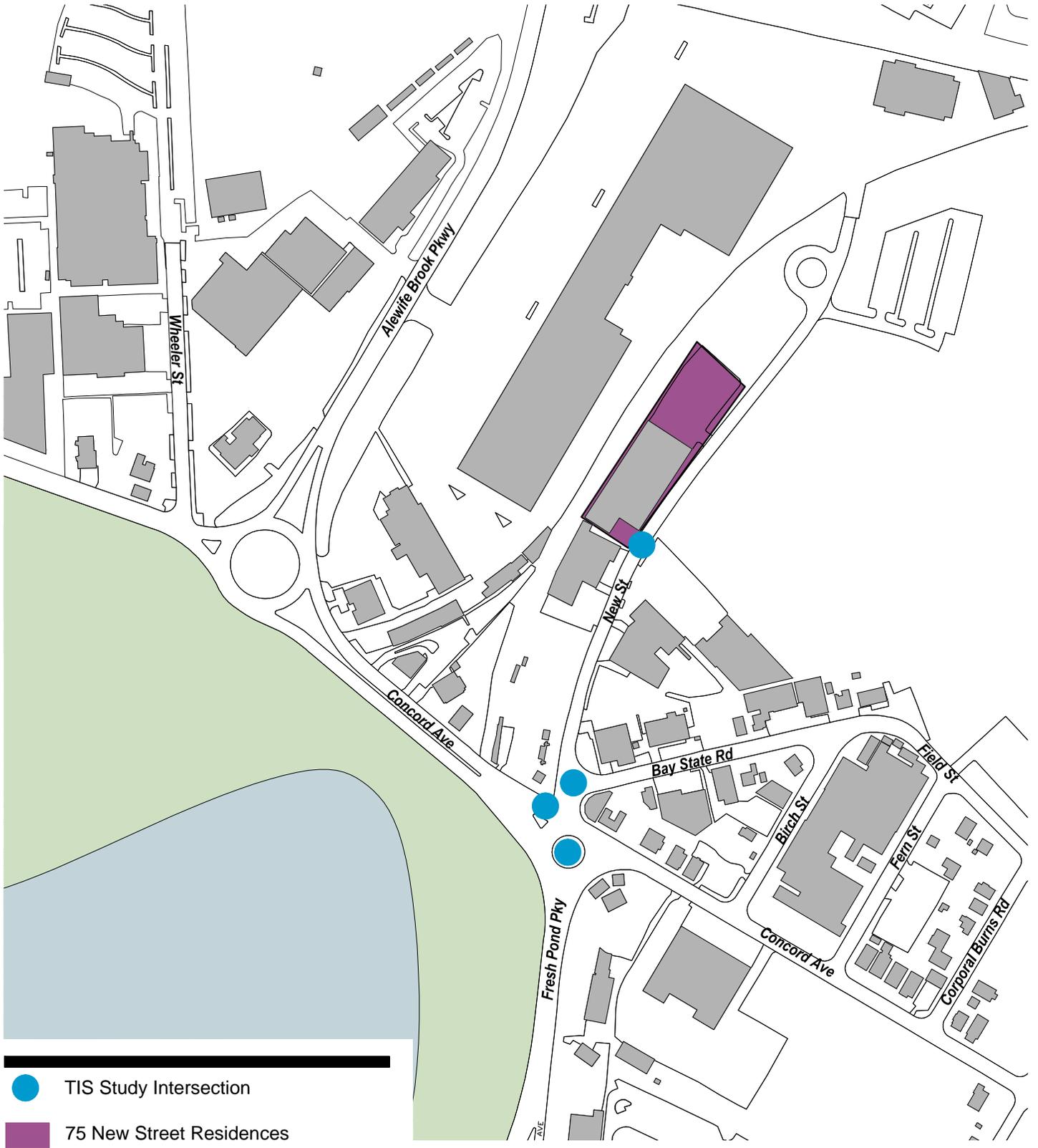




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Figure E
Proposed Parking Layout Plan

75 New Street Residences
Cambridge, Massachusetts

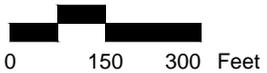


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TIS Study Area

Figure G

75 New Street Residences
Cambridge, Massachusetts





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Planning Board Criteria Summary

Based on the TIS analysis, the project has been evaluated within the context of the Planning Board Criteria to determine if the project has any *potential* adverse transportation impacts. Exceeding one or more of the Criteria is indicative of a *potentially* adverse impact on the City's transportation network. However, the Planning Board will consider mitigation efforts, their anticipated effectiveness, and other information that identifies a reduction in adverse transportation impacts.

The Planning Board Criteria consider the project's vehicular trip generation, impact to intersection level of service and queuing, and increase of volume on residential streets. In addition, pedestrian and bicycle conditions are considered. A discussion of the Criteria set forth by the Planning Board is presented in the final section of this TIS and the Planning Board Criteria Performance Summary is presented below.

Planning Board Permit Number: _____

Project Name: 75 New Street Residential Development

Total Data Entries = 19

Total Number of Criteria Exceedences = 0

a. Project Vehicle Trip Generation

Time Period	Criteria (trips)	Build	Exceeds Criterion?
Weekday Daily	2,000	268	No
Weekday AM Peak Hour	240	33	No
Weekday PM Peak Hour	240	22	No

b. Level of Service (VLOS) at Signalized Intersections

There are no signalized study intersections

c. Traffic on Residential Streets

Roadway	Reviewed Segment	Amount of Residential	AM Peak Hour			PM Peak Hour		
			Existing (2013)	Project Trips	Exceeds Criteria?	Existing (2013)	Project Trips	Exceeds Criteria?
Concord Avenue	Between Sozio Rotary and Fern Street	>1/3 but <1/2	1,249	2	N	984	5	N
New Street	Between Bay State Road and Danehy park	1/3 or less	414	30	N	716	20	N
Bay State Road	Between New Street and Fern Street	1/2 or more	396	8	N	586	2	N

d. Lane Queue (for signalized intersections critical lane)

There are no signalized study intersections

e. Pedestrian and Bicycle Facilities

Intersection	Crosswalk	AM Peak			PM Peak		
		Existing 2013	Build 2013	Exceeds Criterion?	Existing 2013	Build 2013	Exceeds Criterion?
Sozio Rotary	North (east side)	A	A	N	A	A	N
	North (west side)	A	A	N	A	A	N
Concord Avenue Crossing	west of Sozio Rotary (signalized)	C	C	N	C	C	N
Concord Avenue Crossing	east of Sozio Rotary (signalized)	C	C	N	C	C	N

Adjacent Street	Link	Sidewalks or Walkways Present?	Exceeds Criteria	Bicycle Facilities or Right of Ways Present?	Exceeds Criteria
New Street	Adjacent to the Site 75 New Street	Y	N	Y	N

CITY OF CAMBRIDGE

Special Permit Transportation Impact Study (TIS)

Planning Board Permit Number: _____

PROJECT NAME: 75 New Street Residential Development
Address: 75 New Street, Cambridge MA
Owner/Developer Name: AbodeZ Development
Contact Person: Kin Lau
Contact Address: 277 Broadway, Cambridge, MA 02139
Contact Phone: 617-945-8100

SIZE:
ITE sq. ft.: 93 residential rental units
Zoning sq. ft.: 96,049
Land Use Type: Residential

PARKING:
Existing Parking Spaces: 31 **Use:** Commercial
New Parking Spaces: 93 (+ 4 short-term) **Use:** Residential
 (Net addition, 66 spaces)
Date of Parking Registration Approval: N/A

TRIP GENERATION:

	Daily	AM Peak Hour	PM Peak Hour
Total Trips	534	54	46
Vehicle	268	33	22
Transit	192	15	18
Pedestrian	34	3	3
Bicycle	40	3	3

MODE SPLIT (PERSON TRIPS):

Vehicle (SOV): 37% Bicycle: 6%
 Rideshare (HOV): 8% Pedestrian: 5%
 Transit: 29% Work at Home/Other: 15%

TRANSPORTATION CONSULTANT:

Company Name: Vanasse Hangen Brustlin, Inc.
Contact Name: David Black/Erica Guidoboni, P.E.
Phone: 617.728.7777

Date of Building Permit Approval: _____



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Transportation Impact Study

This Transportation Impact Study (TIS) for the proposed residential development at 75 New Street in Cambridge (the project) describes existing and future transportation conditions in the study area in accordance with the current City of Cambridge *Guidelines for Transportation Impact Study*. The study area for the TIS includes New Street and Concord Avenue, and comprises four study-intersections, including the site driveway, as previously shown in **Figure G**.

This section includes inventories of physical and operational conditions in the study area including roadways, intersections, crosswalks, sidewalks, on-street and off-street parking, transit facilities, and land uses. Transportation data that were collected and compiled are presented, including automatic traffic recorder counts, intersection turning movement counts, pedestrian and bicycle counts, vehicle crash data, and transit service data.

1. Inventory of Existing Conditions

a. Roadways

The site is located at 75 New Street in Cambridge, Massachusetts. The site is currently occupied by the existing J&C Adams retail building, supported by a 31 space surface parking lot which will be replaced by the proposed 75 New Street Project. The existing site plan, presented previously in **Figure C**, shows the roadway layout near the project site on New Street.

b. Intersections

The project study area includes the 75 New Street Driveway/New Street intersection, the New Street/Bay State Road intersection, New Street/Concord Avenue, and the Sozio Rotary. The study area intersections are illustrated in **Figures 1.b.1 through 1.b.3**. The existing curb-cuts for the site are shown previously in **Figure C**, and will be maintained for vehicular access as shown on the proposed site plan, **Figure D**, also shown previously.

c. Parking

Existing on-site parking includes a surface lot located on the northern end of the project site, which provides 31 parking spaces for the J&C Adams building. On-



street parking in the vicinity of the site is largely prohibited by No Parking or No Stopping regulations, with the exception of an area opposite the site on the east side of the roadway where two hour parking is permitted from 8AM to 6PM.

d. Transit Services

Figure 1.d illustrates existing Massachusetts Bay Transportation Authority (MBTA) services in the study area. The site is directly served by three MBTA bus routes: 74, 75, and 78. Routes 74 and 78 stop on Concord Avenue near the intersection with New Street in the westbound direction. The eastbound stop for Routes 74 and 78 is adjacent to the Sozio Rotary on the southern side. Bus route 75 stops on Concord Avenue adjacent to Birch Street in the westbound direction and adjacent to Fern Street in the eastbound direction.

Routes 74 and 78 provide service to Harvard Square from Belmont Center and Arlmont Village, respectively. Transit connections at Harvard Square include routes: 1, 66, 68, 69, 71, 72, 73, 74, 75, 77, 78, 86, and 96 in addition to the MBTA Red Line service. Travel time from the project site to Harvard Square via bus routes 74 and 78 is approximately ten minutes (based on MBTA travel times).

Alewife Station, the terminal for the MBTA Red Line, is an approximately 0.8-mile walk from the project site along Alewife Brook Parkway through the commercial parking lot connecting to New Street. Red line service is provided every 4.5 minutes during the peak rush hours.

e. Land Use

Figure 1.e illustrates land uses in the area surrounding the site. The neighborhood is largely characterized by commercial/industrial to the west, including retail and restaurant land uses on both sides of Alewife Brook Parkway to the west of the project site. The Danehy Park which includes several sports fields is located directly across New Street to the east of the site. The adjacent parcel to the north on New Street is the Park87 Residences which provides rental residential housing. To the south of the site there are commercial and industrial land uses.

2. Data Collection

a. ATR Counts

Automatic traffic recorder counts were performed for the 75 New Street TIS for a period of 48 consecutive hours at the following locations:

- Bay State Road, west of Fern Street – *Counted September 12, 2012*



- Concord Avenue, west of Birch Street – *Counted May 30, 2012*
- New Street, south of 87 New Street Driveway – *Counted May 30, 2012*

A traffic volume summary for the ATRs is presented in **Tables 2.a.1 and 2.a.2**. These data, representing the averages of data collected over two weekdays, illustrate the daily variations of traffic demands and the directional flow of traffic over the course of an average weekday. Electronic ATR data collection files are included on the CD accompanying this document.

Table 2.a.1
Existing Traffic Volume Summary

Location	Daily ^a	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Volume ^b	K ^c	Peak Direction	Volume ^b	K ^c	Peak Direction
New Street <i>south of Site Driveway</i>	5,123	291	5.7%	58% SB	566	11.1%	53% NB
Concord Avenue <i>west of Birch Street</i>	14,256	1,032	7.2%	54% WB	953	6.7%	63% EB
Bay State Road <i>east of New Street</i>	5,336	397	7.4%	53%	572	10.7%	55% EB

a vehicles per day
 b vehicles per peak hour
 c percentage of daily traffic that occurs during the peak hour



Table 2.a.2
Existing Average Daily Traffic Summary ^a

<u>Hour</u> <u>Commencing</u>	<u>New Street</u> <u>south of Site Driveway</u>	<u>Concord Avenue</u> <u>West of Birch Street</u>	<u>Bay State Road</u> <u>east of New Street</u>
12:00	8	76	14
1:00	5	51	7
2:00	2	23	3
3:00	4	24	4
4:00	6	51	9
5:00	37	165	32
6:00	85	553	95
7:00	188	983	314
8:00	291	1,032	397
9:00	247	978	310
10:00	260	929	247
11:00	286	864	286
12:00	314	927	321
13:00	320	880	305
14:00	349	875	343
15:00	410	872	406
16:00	478	861	451
17:00	566	903	572
18:00	481	953	478
19:00	341	782	340
20:00	266	540	207
21:00	125	481	125
22:00	40	276	49
<u>23:00</u>	<u>14</u>	<u>177</u>	<u>21</u>
Total	5,123	14,256	5,336

^a vehicles per hour, both directions

Heavy vehicles were identified in the ATR counts and details are provided in the Appendix.

b. Pedestrian and Bicycle Counts

Pedestrian and bicycle turning movement counts were performed on May 24 and May 30, 2012. In addition to pedestrian and bicycle turning movements conducted at study area intersections, movements across Concord Avenue on either side of Sozio Rotary and along the sidewalks adjacent to the crosswalks were collected on May 24, 2012.

c. Intersection Turning Movement Counts

Manual turning movement counts (TMC), including pedestrians and bicycles, were conducted at New Street at Bay State Road on September 12, 2012, at 87 New Street Driveway at New Street on May 24, 2012 and at Sozio Rotary on May



30, 2012. Detailed count data are provided in the Appendix. The peak hour traffic counts were summarized by assuming individual peak hours for each intersection.

The AM and PM peak hour traffic, pedestrian and bicycle turning movements are presented in **Figure 2.c.1**, **Figure 2.c.2** and **Figure 2.c.3**, respectively. Heavy vehicles were also identified in the TMCs and details are provided in the Appendix.

d. Traffic Crash Analysis

Study-area crash data were obtained from MassDOT records for the three-year period from January 2008 through December 2010 (the most recent data available). Analysis of the crash data is summarized in **Table 2.d**, and includes the calculated crash rates (number of reported crashes per million entering vehicles) based on the evening peak traffic volumes. A detailed summary by crash type is presented in the Appendix.

Table 2.d
MassDOT Crash Analysis (2008 – 2010)

Location	Total Crashes (3-year period)	Calculated Crash Rate
New Street at Bay State Road	1	0.08
New Street at Concord Avenue	2	0.10
Sozio Rotary	54	0.88

Source: MassDOT data

The calculated crash rates for New Street at Bay State Road and New Street at Concord Avenue are 0.08, and 0.10 respectively, well below the District 6 average of 0.58 for unsignalized locations. Types of crashes varied between single vehicle, sideswipe, or angled collisions. One of the crashes at the New Street at Concord Ave intersection involved one bicyclist, but there were no injuries reported.

The calculated crash rate for the Sozio Rotary is 0.88. There is no district average to compare this crash rate to at a rotary. Fifty-four reported crashes occurred from 2008-2010 at this rotary and varied between single vehicle, sideswipe, rear end, or angled collisions. Twenty five percent of the accidents resulted in injuries. Two of the crashes reported injuries involving a cyclist or pedestrian. Most of the collisions occurred under dry conditions.

e. Public Transportation

Daily weekday ridership as well as operating hours and peak-hour headway data is provided in **Table 2.e.1** for bus routes 74, 75 and 78, and for the Red Line. The three bus routes provide service along Concord Avenue near the site. Route



74 travels from Belmont Center to Harvard Square, Route 75 travels from Belmont Center to Harvard Square and Route 78 travels from Arlmont Village to Harvard Square.

**Table 2.e.1
MBTA Services**

Route	Origin/Destination	Hours of Operation	Weekday Ridership	Peak Hour Headways
Route 74	Belmont Center/Harvard Sq via Concord Avenue	5:25AM-1:17AM	981	~ 20 min.
Route 75	Belmont Center/Harvard Sq via Fresh Pond Pkwy.	6:50AM-10:20PM	487	~60 min.
Route 78	Arlmont Village/Harvard Sq via Park Circle	5:42AM-12:56AM	1149	~ 20-30 min.
Red Line	Alewife/Ashmont	5:16AM-12:30AM	192,513*	9 min
	Alewife/Braintree	5:15AM-12:18AM		9 min

Source: MBTA Official Public Transit System Map, 2010 Blue Book

* Ashmont/Braintree Ridership Data is combined for Weekday Daily Ridership

Boarding, alighting and load data for bus routes 74, 75 and 78 were obtained for bus stops on Concord Avenue and are summarized in **Table 2.e.2**. These volumes represent data for a single bus during the peak hour and represent the peak bus ridership.

**Table 2.e.2
Bus Boarding and Alighting Counts**

Route		Weekday AM Peak (per bus)			Weekday PM Peak (per bus)		
		Boardings	Alightings	Load	Boardings	Alightings	Load
Inbound	74 (Concord Ave opposite New Street)	0	1	35	1	0	27
	75 (Concord Ave Opposite Fern Street)	3	0	40	2	0	15
	78 (Concord Ave opposite New Street)	0	0	31	0	0	17
Outbound	74 (Concord Ave at New Street)	0	0	17	0	1	40
	75 (Concord Ave at Birch Street)	0	2	7	1	1	37
	78 (Concord Ave at New Street)	0	0	26	0	0	33

Source: Massachusetts Bay Transportation Authority, Fall 2012

Note – data for closest stop available on a bus during peak

3. Project Traffic

a. Mode Share and Average Vehicle Occupancy

Mode share and average vehicle occupancy (AVO) characteristics for the project are based on 2007-2011 American Community Survey data for the project location (Census tract 3546). **Table 3.a** presents the adjusted mode-shares used as a basis for estimating project trip generation for the proposed residential use.



Drive-alone and rideshare were combined to determine overall automobile mode share. The local AVO of 1.11 and national AVO of 1.07 for all automobile trips were incorporated in accordance with the TP&T Scoping Letter.

**Table 3.a
Mode Share**

Mode	Percentage of Trips
Automobile (SOV)	37%
Automobile (HOV)	8%
Transit	29%
Bicycle	6%
Walk	5%
Work at Home	14%
Other	1%

b. Trip Generation

Trip generation estimates were developed based on Institute of Transportation Engineers (ITE) Trip Generation Manual (8th Edition) rates for Apartment (LUC 220). ITE vehicle-trip rates were converted to person trip rates by application of a 1.07 national AVO and local AVO of 1.11, in accordance with the TP&T scoping letter.

The resulting project trip generation by mode for the proposed project is summarized in **Table 3.b.1**.

**Table 3.b.1
Project Person Trip Generation by Mode**

	Vehicle			Transit			Walk			Bicycle		
	Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak
Enter	134	4	16	96	3	12	17	1	2	20	1	2
Exit	134	16	9	96	12	6	17	2	1	20	2	1
Total	268	20	25	192	15	18	34	3	3	40	3	3

Estimates based on ITE 8th Edition LUC 220 (Apartments – 93 units)
Daily trip generation in "trips per day"
Peak hour trip generation in "trips per hour"

It should be noted that the J&C Adams retail building and associated parking lot occupying the site had previously generated vehicle trips when they were operational, but no allowance for the elimination of these trips is included in the analysis. Therefore, the vehicle trip generation as presented is equivalent to the proposed project on a vacant site rather than the proposed project compared to the former use of the site.



As requested by TP&T, VHB performed peak hour counts at the adjacent fully occupied 54-unit residential building at 87 New Street on May 24, 2012. **Table 3.b.2** summarizes the resulting trip generation comparison associated with these observations compared to the ITE-based trip generation presented previously in **Table 3.b.1**.

Table 3.b.2
87 New Street Vehicle Trip Generation Comparison with ITE Rates

Weekday Peak Hour	87 New Street (Park87)		Proposed Project Vehicle Trips	
	Counts	Trip Rates	Trips (Park87 rates)	Trips (ITE)
AM Peak				
Enter	4	0.07	7	4
Exit	15	0.28	26	16
Total	19	0.35	33	20
PM Peak				
Enter	10	0.19	17	16
Exit	3	0.06	5	9
Total	13	0.24	22	25

Source: Vanasse, Hangen, Brustlin, Inc. Counts conducted May 24, 2012. Rates based on 54-units.

As shown, the counts at 87 New Street yielded higher residential vehicle trip generation during the morning peak hour compared to the ITE-based generation. However, during the evening peak hour, the ITE-based generation was higher than the 87 New Street counts based vehicle trip generation. Peak hour generation at the driveway occurred between 8:15 – 9:15 AM and 5:15- 6:15 PM, compared to peak roadway traffic hours between 8:00 – 9:00 AM and 4:30 – 5:30 PM, respectively. The project traffic volumes (Build and Future Conditions) and LOS Capacity Analysis are based on the measured Park87 trip rates. However, since daily vehicle trips are unknown, the ITE method is assumed for all daily trips. Transit, Bike and Walk trips will also be based on ITE methodology. It is not known what percentage of these trips occurs during the peak hours, and therefore standard ITE methodology for these other modes is assumed.

c. Site Access

The Project Site will utilize the existing curb cuts along New Street. The southern driveway will provide access to the parking. The northern curb-cut will provide egress for the pick-up/drop-off loop and short-term parking. The entrance to the pick-up/drop-off loop will be shared with the existing Park87 curb cut and driveway. Pedestrian access will be provided on New Street at the center of the building.

d. Trip Distribution and Assignment



Project-generated residential traffic was regionally distributed based on the City’s Concord-Alewife Planning Study (Nov. 2005). **Table 3.d** summarizes the route assignments for the proposed project trips. Closer to the study area intersections, existing count data from the Park87 Residences counts was utilized to distribute trips from the north and south on Alewife Brook Parkway. Approximately 10 percent of the trips are assumed to travel to and from the site towards the north on New Street while the remaining 90 percent are assumed to utilize New Street to the south.

Table 3.d
Vehicular Trip Distribution

Trip Assignment	Direction	Trip Distribution
Rt. 16 / Fresh Pond Parkway to Memorial Drive	SB	32%
Rt. 16 / Alewife Brook Parkway	NB	8%
Rt. 2 (Concord Turnpike)	WB	3%
Concord Avenue towards Belmont	WB	23%
Concord Avenue towards Harvard Square (outbound via Bay State Road)	EB	30%
Rindge Avenue	EB	4%

Concord Alewife Planning Study, City of Cambridge, November 2005

The percentage distribution of residential trips is shown in **Figures 3.d.1-2**, and the resulting project vehicle trips are shown in **Figure 3.d.3**.

e. Servicing and Deliveries

Due to the residential nature of the proposed project, a limited number of delivery trips over the course of a normal day will be generated. Typical deliveries will include mail and trash collection for the building as a whole. It is worth noting that the previous J&C Adams retail site generated a significant number of trucks delivering and picking-up large items of stock.

Trash and recycling will be managed and contained within a single location on the ground level of the site. Typically, residential trash will be picked up two times per week.

All trash removal will take place on site, using the internal driveway on New Street through the ground-level parking area at the south western edge of the building at grade. A one-way drop-off/pick-up for the residential building will be accommodated adjacent to the residential lobby off of New Street which will utilize existing curb cuts.



4. Background Traffic

In accordance with the TP&T scoping letter, background traffic growth reflecting regional growth was assumed to occur at 0.5 percent per year for five years to the 2018 future year condition. In addition, trips associated with specific planned projects in the area of the project site have been incorporated into the future 2018 analysis, as follows:

- 160 Cambridgepark Drive
- 130 Cambridgepark Drive
- 70 Fawcett Street
- Tyler Green
- 603 Concord Avenue (Concord/Wheeler)
- 165 Cambridgepark Drive
- Faces Project (Vox on Two)

5. Traffic Analysis Scenarios

Traffic networks were developed, in accordance with the TIS Guidelines, for the following scenarios:

a. Existing (2013) Condition

The existing condition analysis is based on existing vehicle, bicycle and pedestrian counts at the study area intersections (see Section 2).

b. Build (2013) Condition

The build condition assumes full occupancy of 93 residential units. Project-generated traffic (see Section 3) was added to the study area to create the Build (2013) networks shown in **Figure 5.b.1**.

c. Future (2018) Condition

Background traffic growth, including specific planned projects was assumed to occur at 0.5 percent per year for five years to the Future (2018) condition. Volumes for this scenario are shown in **Figures 5.c.1**.

As no off-site mitigation is proposed, mitigated conditions were not developed.



6. Vehicle Capacity Analysis

Synchro 7 software is used to determine the vehicle level of service (VLOS) for the three unsignalized study intersections. Synchro software is based on the 2000 Highway Capacity Manual.

VLOS at the Sozio Rotary is determined using SIDRA Intersection 5.1 software. This is preferable for rotary (roundabout) analysis as it yields approach delays which Synchro does not.

Results for the Existing (2013), Build (2013) and Future (2018) conditions are shown in **Tables 6.a.1** and **Table 6.a.2** for the AM and PM peak hours, respectively.

Table 6.a.1
Unsignalized Intersection Level of Service Results – AM Peak Hour

Intersection	Approach	Existing (2013) Condition			Build (2013) Condition			Future (2018) Condition		
		Demand	Delay	VLOS	Demand	Delay	VLOS	Demand	Delay	VLOS
New Street / 75 New Street Site Driveway	EB	n/a	n/a	n/a	26	9.7	A	26	9.8	A
New Street / Bay State Road	WB	172	19.7	C	172	21.3	C	177	22.4	C
New Street/ Concord Avenue (Sozio Rotary)	SB	37	26.7	D	53	29.9	D	54	32.3	D

n/a Under existing conditions the site driveways are currently not in use
Demand Vehicular demand on critical approach
Delay Average delay expressed in seconds per vehicle
VLOS Vehicular level of service

Table 6.a.2
Unsignalized Intersection Level of Service Results – PM Peak Hour

Intersection	Approach	Existing (2013) Condition			Build (2013) Condition			Future (2018) Condition		
		Demand	Delay	VLOS	Demand	Delay	VLOS	Demand	Delay	VLOS
New Street / 75 New Street Site Driveway	EB	n/a	n/a	n/a	6	10.6	B	6	10.7	B
New Street / Bay State Road	WB	271	41.0	E	271	45.5	E	278	53.4	F
New Street/ Concord Avenue (Sozio Rotary)	SB	109	24.6	D	112	25.3	D	115	30.6	D

n/a Under existing conditions the site driveways are currently not in use and therefore not applicable.
Demand Vehicular demand on critical approach
Delay Average delay expressed in seconds per vehicle
VLOS Vehicular level of service



During the morning peak hour, all the unsignalized intersections operate at an acceptable LOS D or better under Existing (2013) and Build (2013) Conditions. There is a minor increase in delay experienced at each critical movement in the study area from the Existing to the Build Conditions however, not enough to impact the LOS grade. The 75 New Street Site Driveway will operate at a LOS A during the morning peak hour under the Build and Future Condition with 26 project trips exiting the driveway.

During the evening peak hour, the 75 New Street Site Driveway approach will operate at a LOS B during the Build and Future Condition with 6 project generated trips in the eastbound direction. The Bay State Road approach to New Street will operate at a LOS E during the Existing and Build Conditions. The New Street approach to Concord Avenue will operate at a LOS D in the southbound critical movement under all three analysis scenarios.

The Future (2018) analysis results in only one change in LOS grade: at the intersection of New Street at Bay State Road during the evening peak hour from LOS E to LOS F with the addition of background traffic through Sozio Rotary.

Sidra Intersection 5.1 software is used to determine the vehicle level of service (VLOS) for the Sozio Rotary. *Sidra* 5.1 software is based on the 2010 Highway Capacity Manual. Overall rotary, as well as individual approach VLOS and delay are reported for morning and evening peak hours in **Tables 6.a.3 and 6.a.4**, respectively.

Table 6.a.3
Roundabout Operations Summary, AM Peak Hour

Location	Approach	Existing (2013) Condition			Build (2013) Condition			Future (2018) Condition		
		Demand ¹	Delay ²	LOS ³	Demand	Delay	LOS	Demand	Delay	LOS
Sozio Rotary	Fresh Pond Pwky NB	1,453	314.7	F	1,455	314.6	F	1,503	353.0	F
	Concord Ave WB	808	444.6	F	810	450.1	F	843	465.2	F
	Concord Ave EB	<u>2,224</u>	<u>81.8</u>	<u>F</u>	<u>2,235</u>	<u>83.6</u>	<u>F</u>	<u>2,381</u>	<u>111.1</u>	<u>F</u>
	Overall	4,484	222.6	F	4,500	224.3	F	4,727	251.1	F

Based on US Highway Capacity Manual 2010.

1. Demand-Approach volume in vehicles per hour
2. Delay – Average delay in seconds per vehicle
3. LOS – Level of Service (LOS F will result in v/c>1 irrespective of movement delay value)



Table 6.a.4
Roundabout Operations Summary, PM Peak Hour

Location	Approach	Existing (2013) Condition			Build (2013) Condition			Future (2018) Condition		
		Demand ¹	Delay ²	LOS ³	Demand	Delay	LOS	Demand	Delay	LOS
Sozio Rotary	Fresh Pond Pwky NB	1,259	188.0	F	1,265	192.5	F	1,360	254.3	F
	Concord Ave WB	380	68.3	F	385	71.4	F	452	107.6	F
	Concord Ave EB	<u>2,133</u>	<u>77.5</u>	<u>F</u>	<u>2,140</u>	<u>78.9</u>	<u>F</u>	<u>2,295</u>	<u>104.0</u>	<u>F</u>
	Overall	3,772	113.5	F	3,790	116.0	F	4,107	154.2	F

Based on US Highway Capacity Manual 2010.

1. Demand-Approach volume in vehicles per hour
2. Delay – Average delay in seconds per vehicle
3. LOS – Level of Service (LOS F will result in v/c>1 irrespective of movement delay value)

Sozio Rotary currently operates at a LOS F at each approach during both the morning and evening peak hours. The rotary will continue to operate at a LOS F during the Build (2013) and Future (2018) Condition scenarios during both peak hours. The Project is expected to increase the delay at the overall rotary by only two seconds during the morning peak hour and three seconds during the evening peak hour when comparing the Build Condition with the Existing Condition.

7. Queue Analysis

No signalized locations are analyzed, and therefore queue analysis is not presented.

8. Residential Street Volume Analysis

Tables 8.a.1 and 8.a.2 present the peak hour traffic volumes on study area roadways under Existing, Build and Future conditions, including the increase in two-way traffic volume for Build compared with Existing, expressed in project trips and as a percentage increase.

Of all of the roadway segments in the study area identified in **Tables 8.a.1 and 8.a.2**, a total of two (2) segments are streets which have more than 1/3 of residential frontage, as determined by the existing first floor use. One segment has 1/3 or less residential frontage. These segments are evaluated in the Planning Board Criteria for increased volume on residential streets. Roadways within the study area that will not experience an increase in traffic as a result of the Project were not included in the Residential Street Volume Analysis.

The residential street analysis shows a small increase in traffic with the addition of the Project trips to the study area intersections. The traffic volume is expected



to increase by 2 percent or less along the Residential Street segments (1/3 or more) in the study area under the Build scenario.

**Table 8.a.1
Traffic on Study Area Roadways, AM Peak**

Roadway	Reviewed Segment	Amount of Residential	Traffic Volumes and Increases						
			Existing (2013)	Build (2013)	Increase (Project Trips)	% Increase	Future (2018)	Increase	% Increase
Concord Avenue	Between Sozio Rotary and Fern Street	>1/3 but <1/2	1,249	1,251	2	0.2%	1,330	79	6.3%
New Street	Between Bay State Road and Danehy park	1/3 or less	414	444	30	7.2%	454	10	2.3%
Bay State Road	Between New Street and Fern Street	1/2 or more	396	404	8	2.0%	414	10	2.5%

**Table 8.a.2
Traffic on Study Area Roadways, PM Peak**

Roadway	Reviewed Segment	Amount of Residential	Traffic Volumes and Increases						
			Existing (2013)	Build (2013)	Increase (Project Trips)	% Increase	Future (2018)	Increase	% Increase
Concord Avenue	Between Sozio Rotary and Fern Street	>1/3 but <1/2	984	989	5	0.5%	1,115	126	12.7%
New Street	Between Bay State Road and Danehy park	1/3 or less	716	736	20	2.8%	754	18	2.5%
Bay State Road	Between New Street and Fern Street	1/2 or more	586	588	2	0.3%	602	14	2.4%

9. Parking Analysis

As requested in the TP&T scoping letter, parking demand at the existing, adjacent residential building at 87 New Street was investigated. The occupied building provides 54 parking spaces in a secure, surface and below-grade garage to support the 54 residential units.

Observations performed on July 30, 2013 at 11AM showed that 11 cars were parked in the garage, reflecting an 20 percent occupancy. At 11:30 PM, there were 42 cars parked in the garage reflecting an 78 percent occupancy. The parking observations are summarized in **Table 9.a.1**.

**Table 9.a.1
Existing Park87 Residential Parking Occupancy Counts**

	Total # Parking Spaces	Total Occupied at 11 AM	% Occupancy	Total Occupied at 11:30 PM	% Occupancy
Vehicle Parking	54	11	20%	42	78%
Bicycle Parking	-	31	-	28	-

Source: AbodeZ Counted on July 30, 2013



The project parking demand and supply is summarized in **Table 9.a.2** which assumes a parking ratio of 1 space per unit.

**Table 9.a.2
Parking Demand and Supply**

Use	Size	Parking Ratio	Parking Demand	Parking Supply
Residential (Apartments)	93 units	1.0	93	24 spaces outdoors at grade/ 69 spaces basement grade=93 spaces

An additional calculation involves utilizing the American Community Survey vehicles available data for Census Tract 3546. **Table 9.a.3** presents these data and resulting calculation of parking demand.

**Table 9.a.3
Parking Demand**

Vehicles Available	% of Residents	# of Total Residents	# of Vehicles
0 vehicles available	11%	35	0
1 vehicle available	56%	110	55
2 vehicles available	20%	33	33
<u>3 or more vehicles available</u>	<u>13%</u>	<u>7</u>	<u>11</u>
Total	100%	185	99

Source: 2007-2011 American Community Survey data
Note: assume 2 residents/unit

The parking demand analysis method assumes that each unit has an average of two residents. The 2007-2011 American Community Survey data provides information for the census tract 3546 for what percent of residences have access to 0 vehicles, 1 vehicle, 2 vehicles and 3 plus vehicles. The total number of residents, 186 is multiplied by each percent to determine the number of residents that have access to each number of vehicles available. The number of residents is then multiplied by the number of vehicles and divided by the number of residents per unit to determine the total number of vehicles for the building. A five percent vacancy rate is applied to the 99 vehicles to obtain a parking demand of approximately 94 spaces which is very close to the proposed 93 parking spaces.

The proposed total parking supply for the project represents an addition of 93 (plus four short-term) residential parking spaces on the project site, compared to the existing 31 commercial space parking lot.



Visitor parking demand will be met by the proposed four short-term parking spaces at the front entrance of the building as well as by the two-hour parking across from the Site on New Street.

10. Transit Analysis

The project is expected to generate 15 new transit trips (3 entering, 12 exiting) during the AM peak-hour and 18 new transit trips (12 entering, 6 exiting) during the PM peak hour. To present a conservative analysis, it is assumed that all transit riders generated by the project will use the 74, 75 and 78 bus routes, and that all bus trips will occur to and from Harvard Square, with no trips to and from Belmont Center or Arlmont Village during the peak hours. Further, although it is expected that some residents will utilize the Red Line station at Alewife, all transit trips have been assigned to the three bus routes to provide a conservative analysis.

Each bus route operates with approximately 20- to 60 minute headways during the peak hours, together providing approximately six buses to Harvard per hour along Concord Avenue. Distribution of the new transit trips between the three bus routes over the course of the hour will result in two additional inbound (towards Harvard Square) riders per bus and an additional one outbound rider per bus during the AM peak. During the evening peak, there will be one additional inbound rider per bus and two additional outbound riders per bus.

Table 10.a summarizes the resulting bus trips.

Table 10.a
Project Generated Transit Trips

Route		Project Bus Trips (per bus)	
		AM	PM
Route 74	Inbound	2	1
	Outbound	1	2
Route 75	Inbound	2	1
	Outbound	1	2
Route 78	Inbound	2	1
	Outbound	1	2

This analysis represents a worse-case scenario for bus usage as some transit users will walk to the Red Line station at Alewife, located 0.8-miles from the site, rather than using the bus routes. This is especially the case for those traveling to Davis Square, Porter Square or other areas north of Harvard Square. In addition, some riders may travel to Belmont or Arlington using these bus routes in the westbound direction during the morning and in the eastbound direction in the



evening. As a result of the project, 2 additional riders per bus at the worst case, is not expected to have a perceptible impact on capacity.

11. Pedestrian Analysis

Pedestrian volumes are presented previously in Section 2.c, and are shown in **Figure 2.c.2**.

Table 11.a shows a comparison of Existing (2013), Build (2013) and Future (2018) pedestrian level-of-service (PLOS) at crosswalks in the study area.

Table 11.a
Pedestrian Level of Service Summary

Intersection	Crosswalk	AM Peak Hour			PM Peak Hour		
		Existing (2013)	Build (2013)	Future (2018)	Existing (2013)	Build (2013)	Future (2018)
Sozio Rotary	North (east side)	A	A	A	A	A	A
	North(west side)	A	A	A	A	A	A
Concord Avenue Crossing	west of Sozio Rotary (signalized)	C	C	C	C	C	C
Concord Avenue Crossing	east of Sozio Rotary (signalized)	C	C	C	C	C	C

Under Existing (2013) conditions, both crosswalks across the northern leg of Sozio Rotary operate at PLOS A during the AM and PM peak conditions. The crosswalks will continue to operate at a PLOS A under Build (2013) and Future (2018) Conditions. The signalized crosswalks east and west of Sozio Rotary operate at a PLOS C during the existing morning and evening peak hours.

Because they are signalized, the crossings on Concord Avenue experience no degradation in PLOS under the Build and Future Conditions.

Within the project site, pedestrian facilities will be designed to meet appropriate safety and accessibility standards. Generally, existing sidewalks and accessibility adjacent to the site and along New Street are satisfactory. Closer towards the Bay State Road/New Street intersection south of the project site, there is a missing portion of sidewalk on the west side of the roadway. It is important to note that the most direct pedestrian route to Alewife Station includes walking north on New Street and connecting to Alewife Brook Parkway through the commercial parking lot. There are some portions of the parking lot that do not contain pedestrian walkways or crosswalks. Alternatively, pedestrians can walk south on New Street and connect to Concord Avenue then to Alewife Brook Parkway.



12. Bicycle Analysis

As shown in **Figure 12**, the project site is well served by multi-use/bicycle paths. Multi-use/bicycle paths are distinguished by their physical separation from vehicular traffic and by the various types of modes that utilize them. Near the site, a path is located along the perimeter of the Fresh Pond. Bicycle lanes are characterized by being physically part of a street separated by a lane marking and are solely used by bicyclists. Along the length of Concord Avenue, bicycle lanes in both directions have been upgraded to cycle tracks which are defined as a grade separated bicycle lane usually located between the street and sidewalk.

Conflicting vehicle turning movements at the study area intersections are presented previously in **Figure 2.c.3**. These volumes are summarized in **Table 12.a** for Existing (2013), Build (2013) and Future (2018) conditions.

Table 12.a
Conflicting Bicycle Movements

Location	Time Period	Bicycle Direction	Existing Peak Hour Bicycle Volume	Existing (2013)		Build (2013)		Future (2018)	
				Right Turn ^a	Left Turn ^b	Right Turn ^a	Left Turn ^b	Right Turn ^a	Left Turn ^b
75/87 New Street Driveway at New Street	AM	SB	2	2	2	3	8	3	8
	PM	SB	5	3	7	5	22	5	22
New Street at Bay State Road	AM	NB	6	49	175	49	183	50	187
	PM	NB	1	48	267	48	269	49	275
Sozio Rotary	AM	WB	24*	266*	-	272*	-	279*	-
	PM	WB	26*	244*	-	259*	-	265*	-

a Advancing volume

b Opposing volume

* Cyclists are provided a crosswalk to cross this portion of the rotary and are treated like pedestrians at this conflict

Currently, there are no bicycle accommodations on New Street. As shown previously on the site plans (**Figures D, E and F**), bicycle racks will provide 98 secure bicycle parking spaces as well as 10 additional short-term spaces. This supply meets the recently amended zoning requirement of 1.05 bicycle spaces per residential unit.



13. Transportation Demand Management Plan

The project proponent will support a program of transportation demand management (TDM) actions to reduce automobile trips generated by the project. The goal of the project's TDM plan is to reduce the use of single occupant vehicles (SOVs) by encouraging carpooling and vanpooling, bicycle commuting and walking, and increased use of the area's public transportation system by residents.

The following TDM programs will be implemented as part of the proposed project to encourage residents to use alternatives to SOV travel:

- The proponent will contact a car sharing provider (such as Zipcar) to determine the feasibility of establishing a car share program for tenants and will provide parking spaces on site for at least one car share vehicle, subject to demand.
- The proponent will join a local Transportation Management Association (TMA) if one is established in the area.
- The proponent will designate a transportation coordinator to oversee all transportation matters for the project, including vehicular operations, servicing and loading, parking and the TDM programs. The transportation coordinator will act as the contact and liaison for the City of Cambridge, the TMA and the tenants of the project.
- The proponent will make available transit maps, schedules and other information relevant to commuting options in the residential building lobby.
- The proponent will provide a MBTA Subway & Bus Charlie Card for one month to each new resident, to introduce them to and encourage use of transit.
- The proponent will charge for parking separately from apartment rent.



Planning Board Special Permit Criteria

Consistent with Section IV, “Guidelines for Presenting Information to the Planning Board” of the City of Cambridge “Transportation Impact Study Guidelines,” Fifth Revision dated April 27, 2004, this section presents a summary of potential impacts to the transportation network as a result of the proposed project.

According to the guidelines, exceeding one or more of the criteria shall be indicative of a *potentially* adverse impact on City’s transportation network; however, the Planning Board will consider mitigation efforts, their anticipated effectiveness, and other information that identifies a reduction in adverse traffic impacts.

Criterion A - Project Vehicle Trip Generation

Table A-1 presents the project vehicle trip generation criterion. Morning and evening peak hour Project vehicle trip generation is based on existing Park87 driveway counts as discussed previously. Daily Project vehicle trip generation is based on ITE trip rates, adjusted for local mode split and vehicle occupancy rates as discussed previously.

Table A-1
Project Vehicle Trip Generation

Time Period	Criteria (trips)	Build	Exceeds Criterion?
Weekday Daily	2,000	268	No
Weekday AM Peak Hour	240	33	No
Weekday PM Peak Hour	240	22	No

The project is not expected to exceed the criteria for project vehicle trip generation established by the Planning Board under the Build program.



Criterion B - Vehicular LOS at Signalized Intersections

There are no signalized study intersections, and therefore no project-induced vehicle level of service criteria exceedences.

Criterion C – Traffic on Residential Streets

This criterion considers the magnitude of Project vehicle trip generation during any peak hour that may reasonably be expected to arrive and/or depart by traveling on a residential street. The criteria, based on a Project-induced traffic volume increase on any two-block residential street segment in the study area, are summarized in Table C-1.

Two (2) roadway segments in the study area identified as street segments which have more than 1/3 of residential frontage, and are therefore evaluated against the traffic volume criteria. Since New Street will have two large residential buildings in the future build scenario, it is also included in the analysis. The results are presented in Table C-2.

Table C-1
Criterion: Traffic on Residential Streets

Parameter 1: Amount of Residential ¹	Parameter 2: Current peak Hour Street Volume (two-way vehicles)		
	< 150 VPH	150 – 400 VPH	> 400 VPH
1/2 or more	20 VPH ²	30 VPH ²	40 VPH ²
> 1/3 but < 1/2	30 VPH ²	45 VPH ²	60 VPH ²
1/3 or less	No Max.	No Max.	No Max.

¹ Amount of residential for a two block segment as determined by first floor frontage
² Additional Project vehicle trip generation in vehicles per lane, both directions
Vph vehicles per hour

Table C-2
Traffic on Residential Streets

Roadway	Reviewed Segment	Amount of Residential	AM Peak Hour			PM Peak Hour		
			Existing (2013)	Project Trips	Exceeds Criteria?	Existing (2013)	Project Trips	Exceeds Criteria?
Concord Avenue	Between Sozio Rotary and Fern Street	>1/3 but <1/2	1,249	2	N	984	5	N
New Street	Between Bay State Road and Danehy park	1/3 or less	414	30	N	716	20	N
Bay State Road	Between New Street and Fern Street	1/2 or more	396	8	N	586	2	N



Criterion D – Lane Queue

This criterion considers the project’s impact to queues at signalized intersections within the study area. As no study area intersections are signalized, no queue analysis is required and there are no exceedences.

Criterion E – Pedestrian and Bicycle Facilities

The pedestrian and bicycle criterion has the following three components:

a. Pedestrian Delay

Pedestrian delay is a measure of the pedestrian crossing delay on a crosswalk during the peak hour as determined by the pedestrian level of service analysis in the HCM 2000.

Table E-1 presents the indicators for this criterion. **Table E-2** presents the evaluation of PLOS criteria for each crosswalk at study area intersections under Existing (2013) and Build (2013) conditions.

Table E- 1
Criterion: Pedestrian Level of Service Indicators

Existing	With Project
PLOS A	PLOS A
PLOS B	PLOS B
PLOS C	PLOS C
PLOS D	PLOS D or increase of 3 seconds
PLOS E, F	PLOS D

Table E-2
Pedestrian Level of Service Summary

Intersection	Crosswalk	AM Peak			PM Peak		
		Existing (2013)	Build (2013)	Exceeds Criterion?	Existing (2013)	Build (2013)	Exceeds Criterion?
Sozio Rotary	North (east side)	A	A	N	A	A	N
	North(west side)	A	A	N	A	A	N
Concord Avenue Crossing	west of Sozio Rotary (signalized)	C	C	N	C	C	N
Concord Avenue Crossing	east of Sozio Rotary (signalized)	C	C	N	C	C	N



b. Safe Pedestrian Facilities

The project site is well connected to existing pedestrian sidewalks along surrounding streets providing access to the proposed development, with two signalized crosswalks on Concord Avenue on either side of Sozio Rotary. The signalized crosswalks operate at an acceptable level of service allowing for safe access across Concord Avenue, as well as the Fresh Pond Reservation. There is a missing piece of sidewalk south of the Project site on the west side of New Street north of Sozio Rotary.

Within the project site, pedestrian facilities will be designed to meet appropriate safety and accessibility standards.

c. Safe Bicycle Facilities

As shown in **Figure 12**, the area around the project is well-served by several multi-use/bicycle paths and bicycle lanes. Multi-use/bicycle paths are distinguished by their physical separation from vehicular traffic and by the various types of modes that utilize them. Near the site, paths are located around the perimeter of Fresh Pond Fresh and the east side of Alewife Brook Parkway. Bicycle lanes are characterized by being physically part of a street separated by a lane marking and are solely used by bicyclists. The bicycle lanes on Concord Avenue have been upgraded to new cycle tracks in both directions as part of the largely-complete construction of improvements.

Currently there are no bicycle parking accommodations on the project site. The proposed residential development will include 1.05 bicycle spaces per residential units (98 spaces), to be located within the basement-grade secure residential garage. Short-term bicycle parking (10 spaces) will be provided near the entrance of the residential building along New Street.

As summarized in Table E-3 there is a pedestrian sidewalk on either side of New Street near the project site, however there are no bicycle accommodations present.

**Table E-3
Pedestrian and Bicycle Facilities**

Adjacent Street	Link (between)	Sidewalks or Walkways Present?	Exceeds Criteria	Bicycle Facilities or Right of Ways Present?	Exceeds Criteria
New Street	Adjacent to the Site 75 New Street	Y	N	Y	N

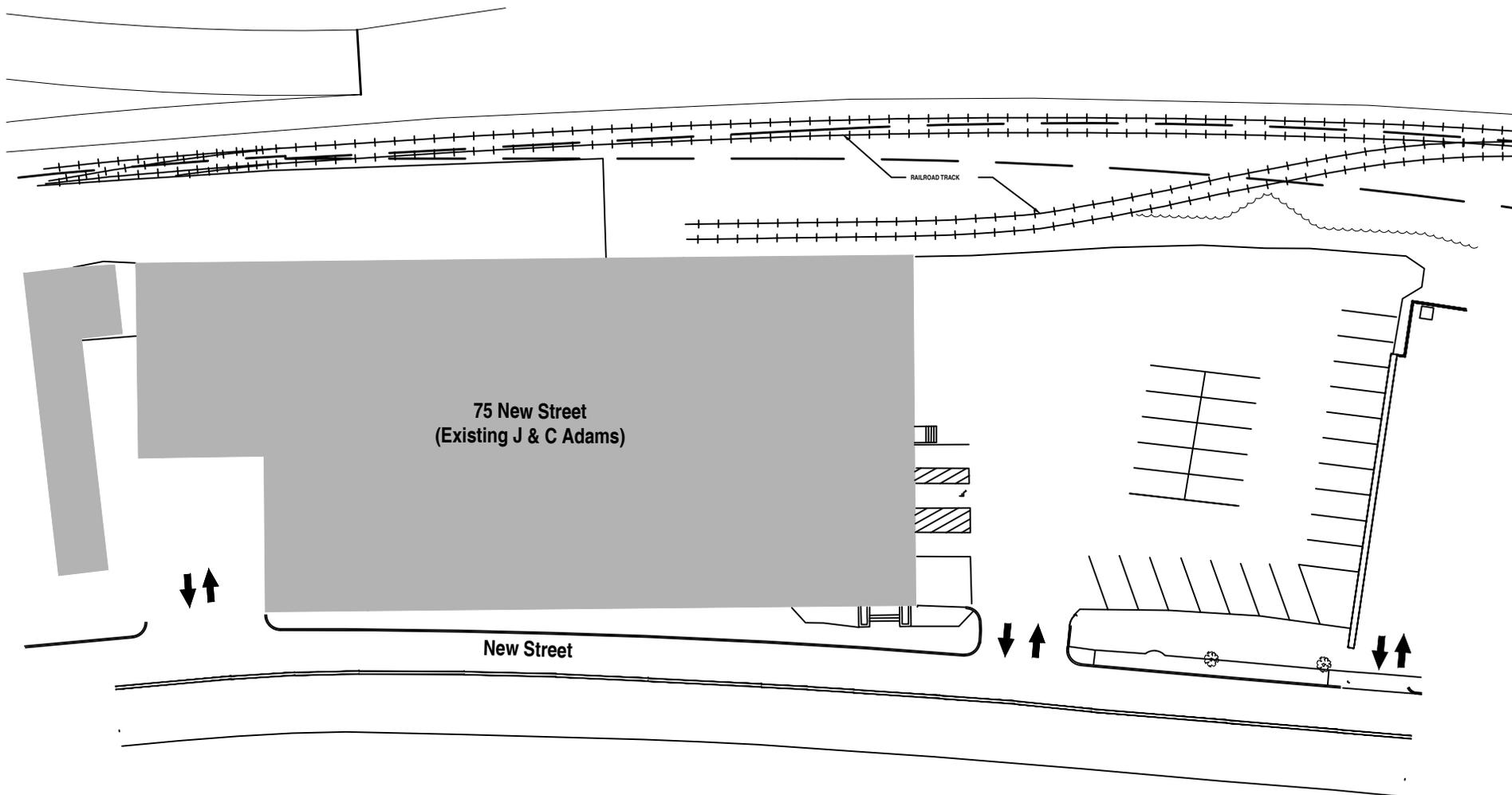
Source: VHB observations 2013



TIS Figures

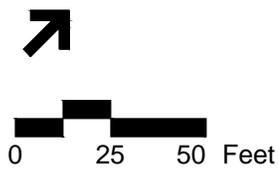


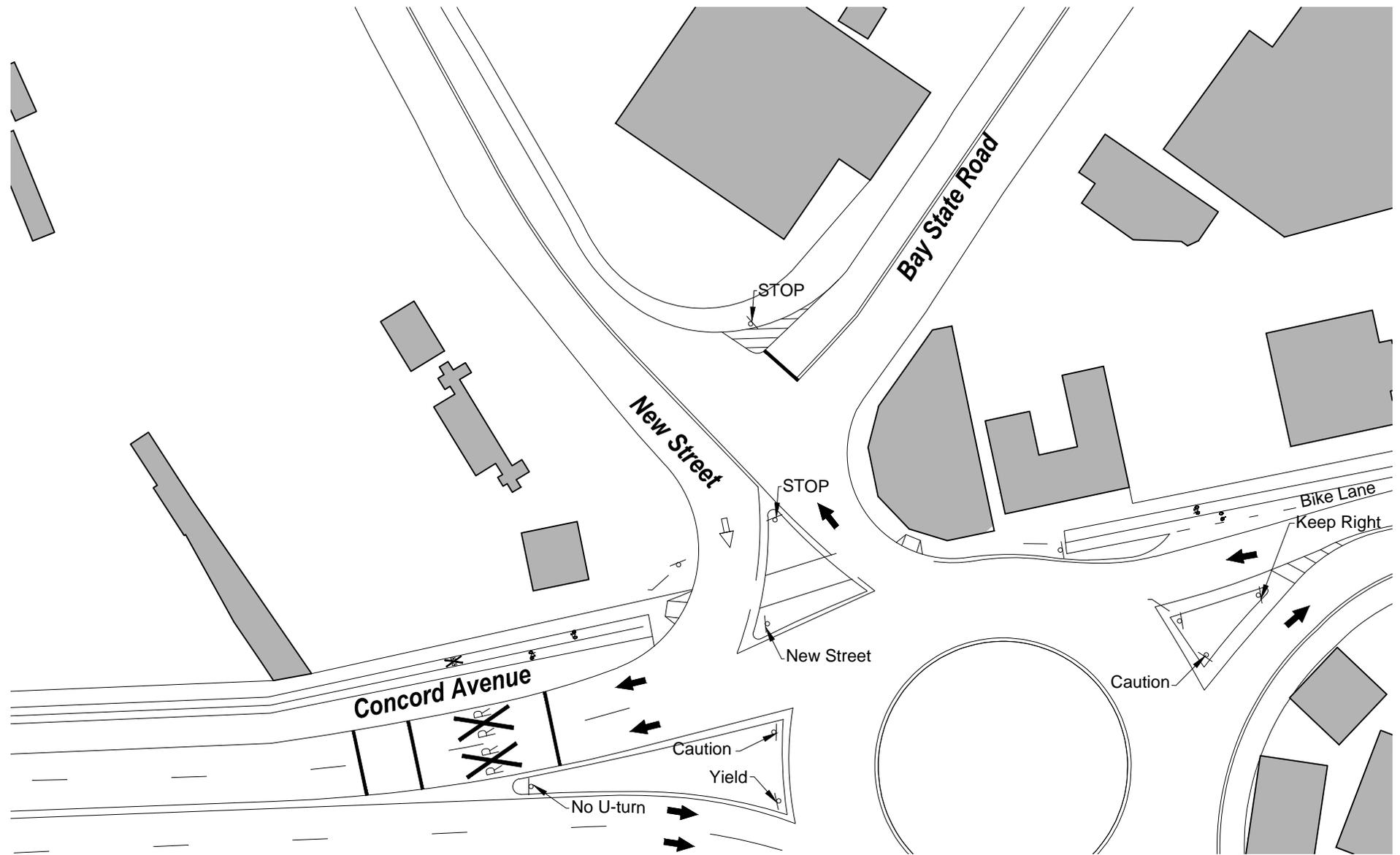
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Vanasse Hangen Brustlin, Inc.

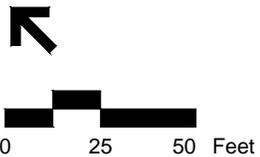
Figure 1.b.1
75/87 New Street Driveways at New Street
(Unsignalized) Intersection Geometry
75 New Street Residences
Cambridge, Massachusetts

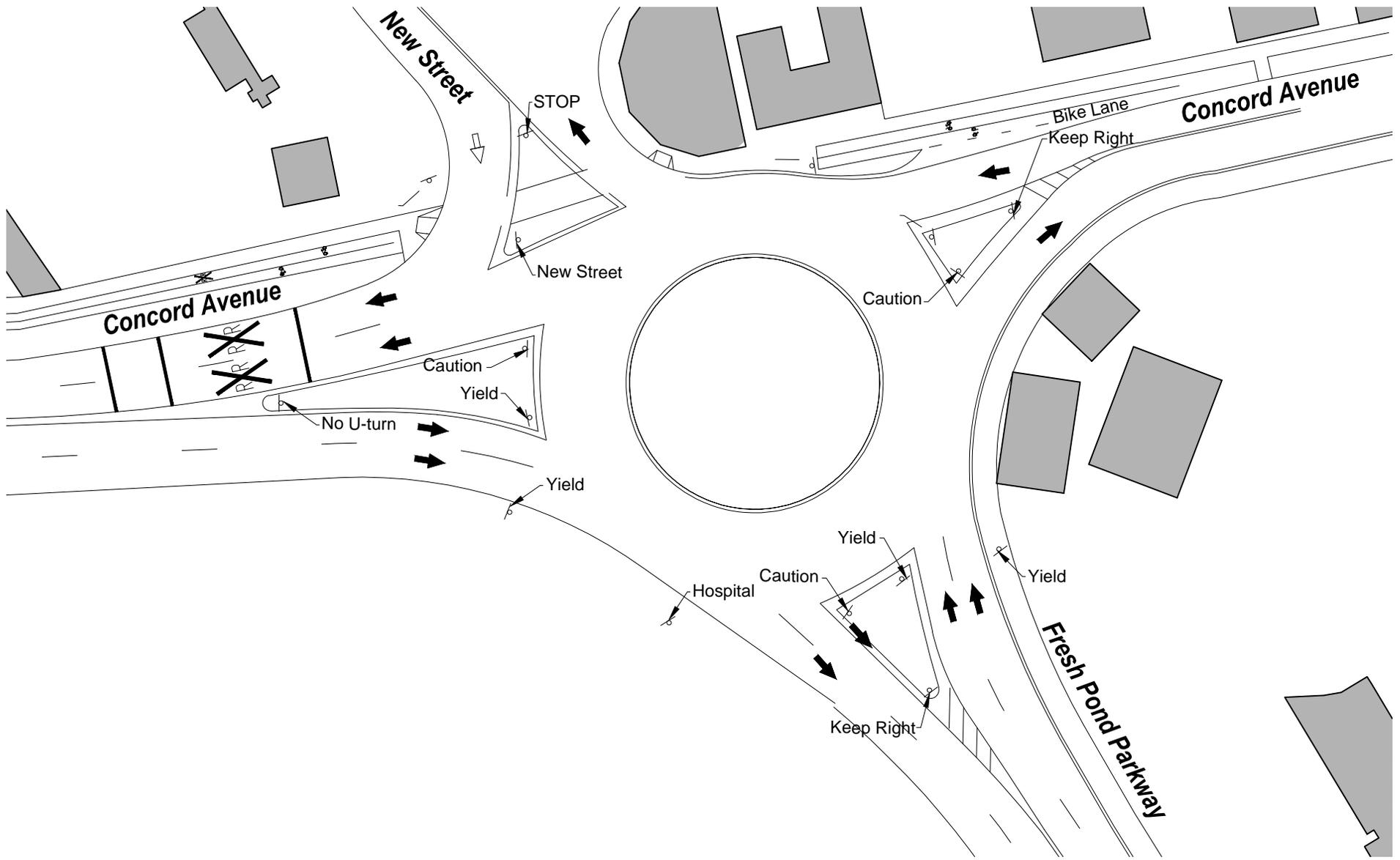




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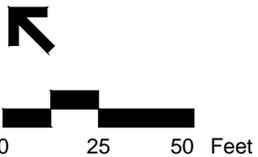
Figure 1.b.2
New Street at Bay State Road
(Unsignalized) Intersection Geometry
75 New Street Residences
Cambridge, Massachusetts





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Figure 1.b.3
Sozio Rotary
(Unsignalized) Intersection Geometry
75 New Street Residences
Cambridge, Massachusetts

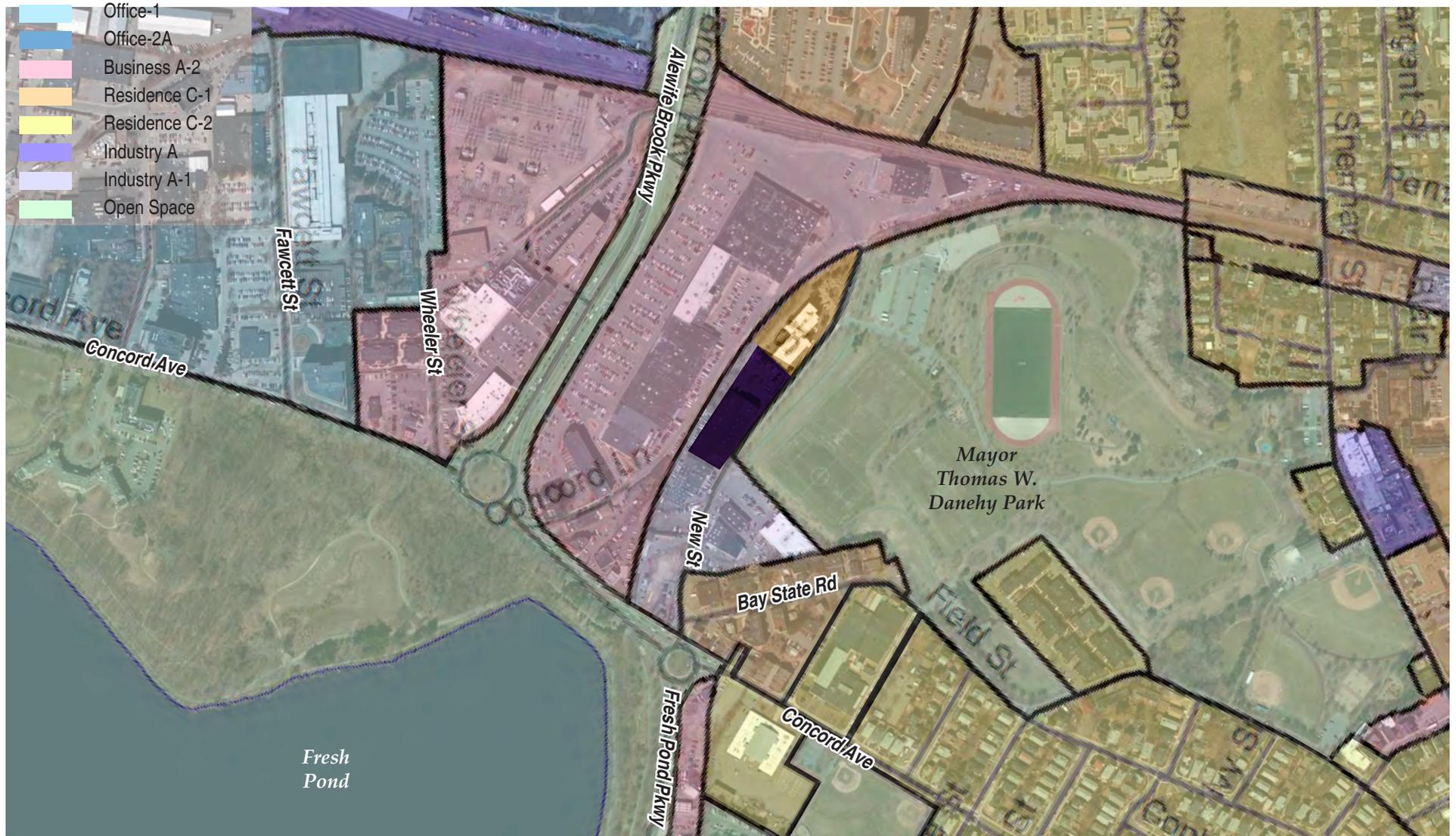




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Figure 1.d
Public Transportation

75 New Street Residences
Cambridge, Massachusetts

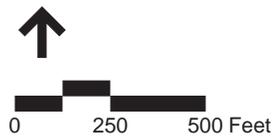


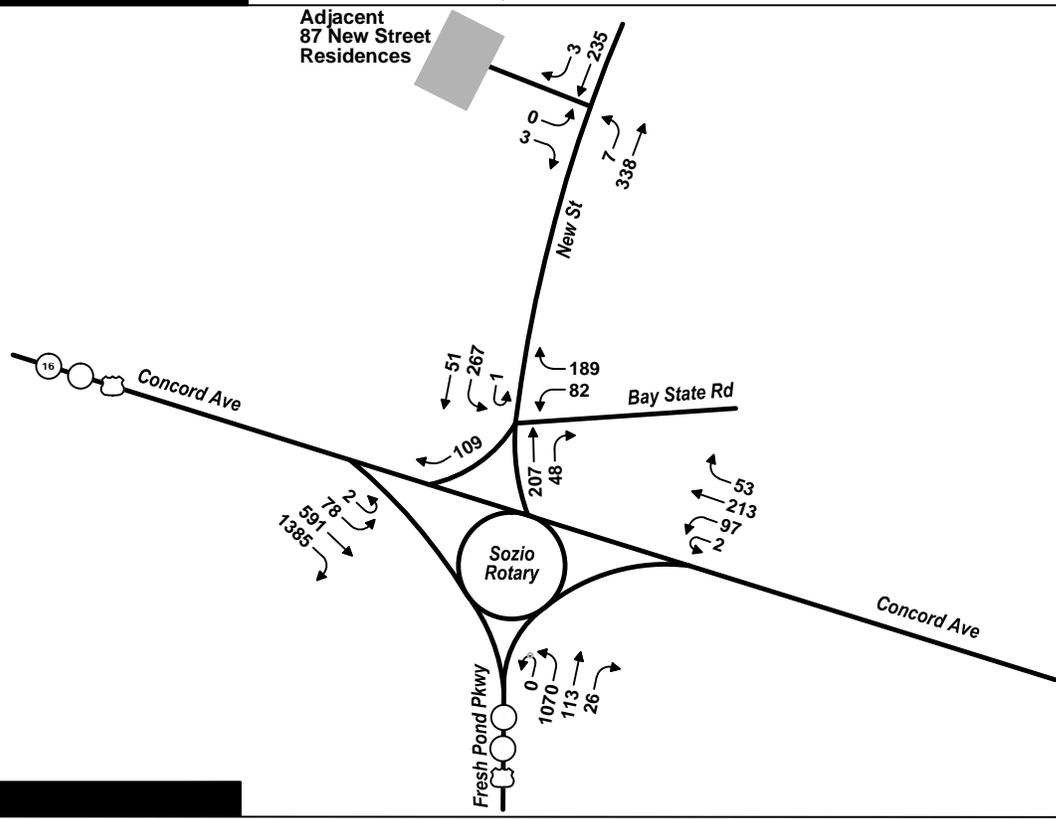
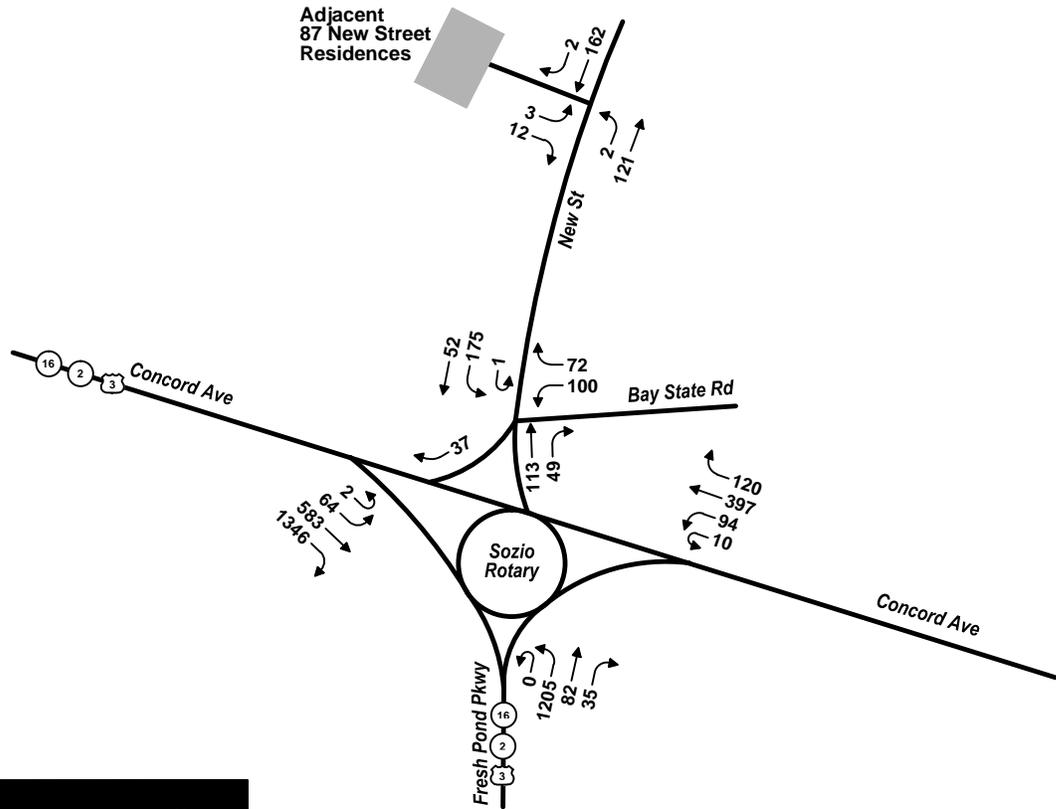
Source: City of Cambridge Community Development Department, April 2013
Note: updated based on field observations

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Figure 1.e
Land Use

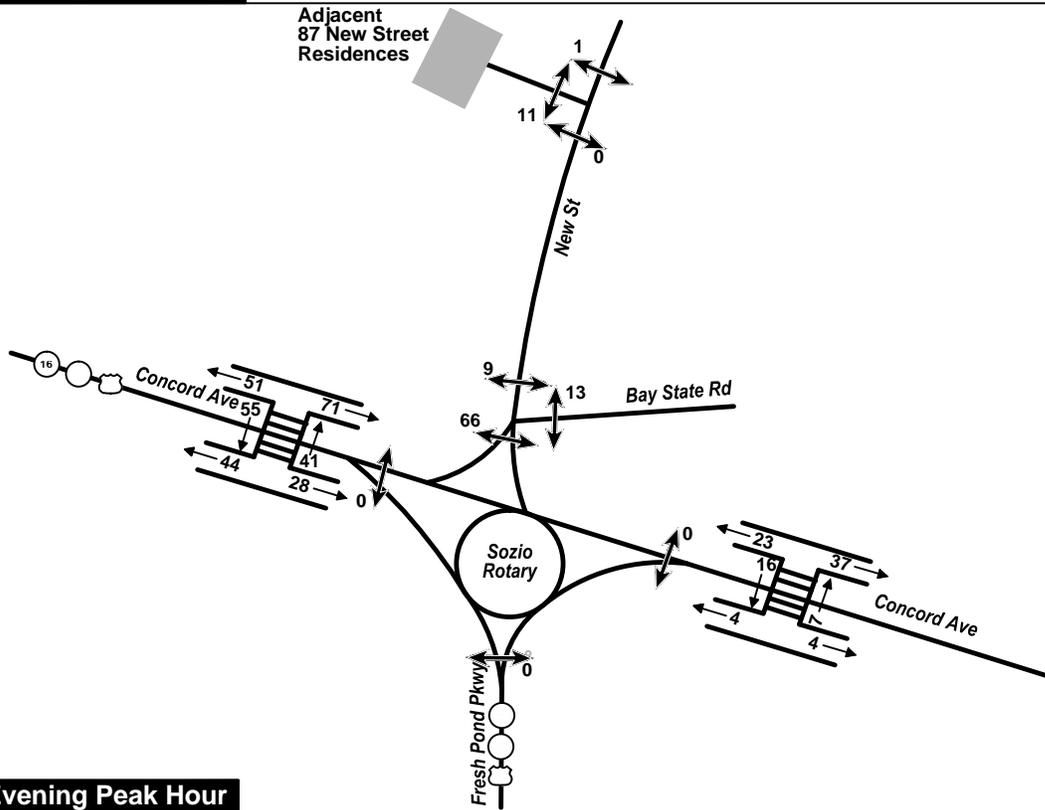
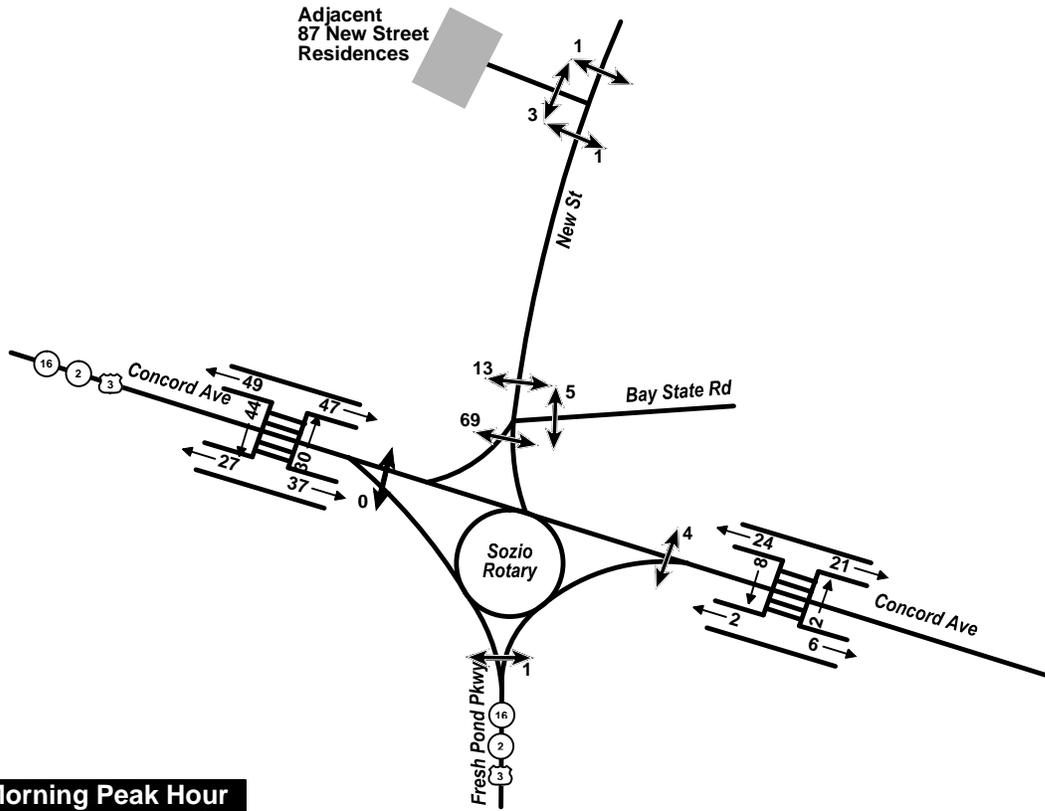
75 New Street Residences
Cambridge, Massachusetts





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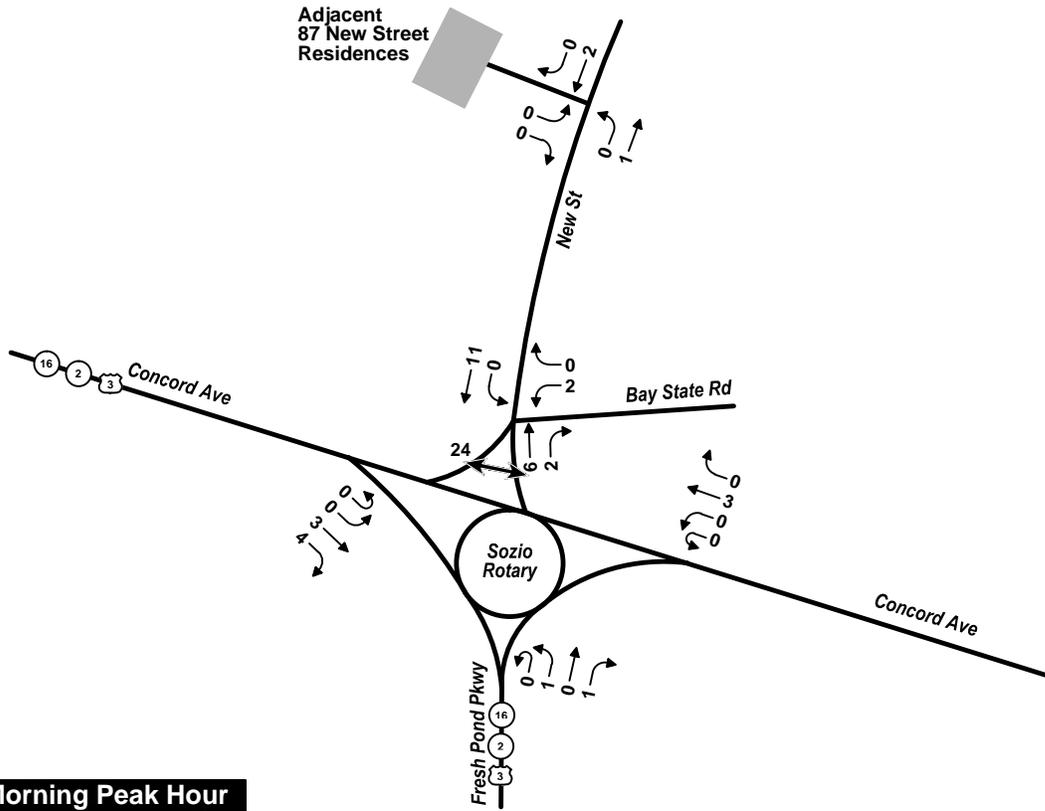
Existing (2013) Traffic Volumes **Figure 2.c.1**
 Counted 5/24/2012, 5/30/2012 and 9/12/2012
 75 New Street Residences
 Cambridge, Massachusetts



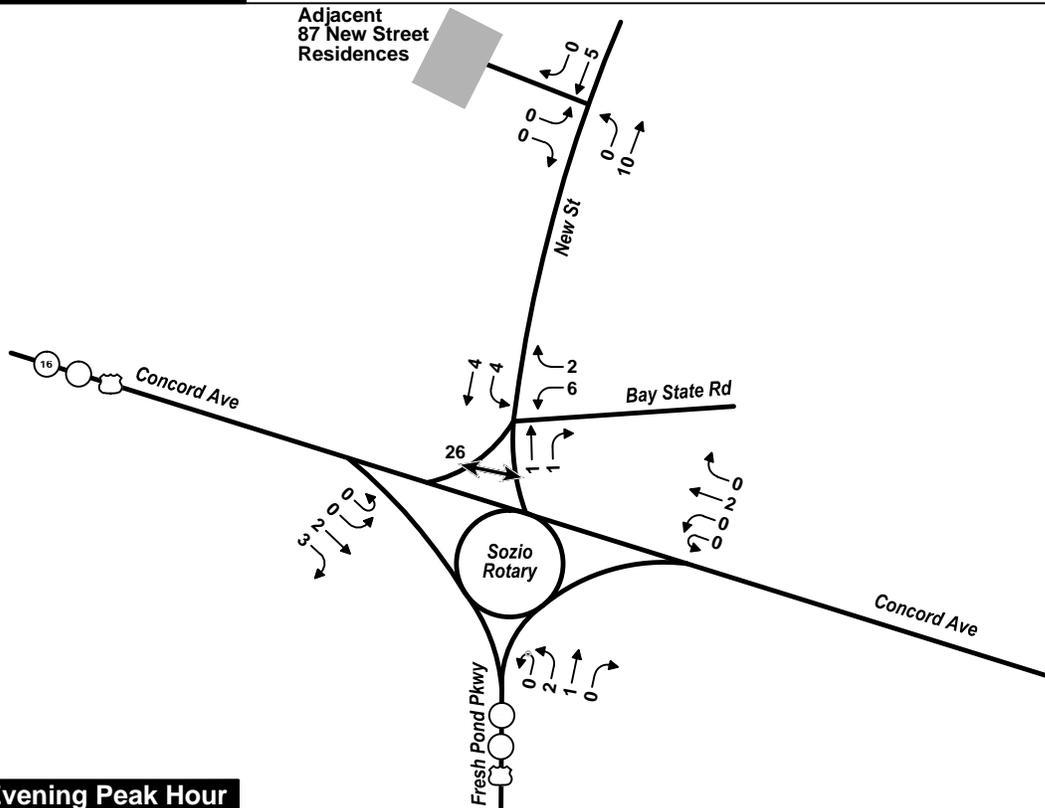
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2013 Existing Pedestrian Volumes
 Counted 5/24/2012, 5/30/2012 and 9/12/2012
 75 New Street Residences
 Cambridge, Massachusetts

Figure 2.c.2



Weekday Morning Peak Hour

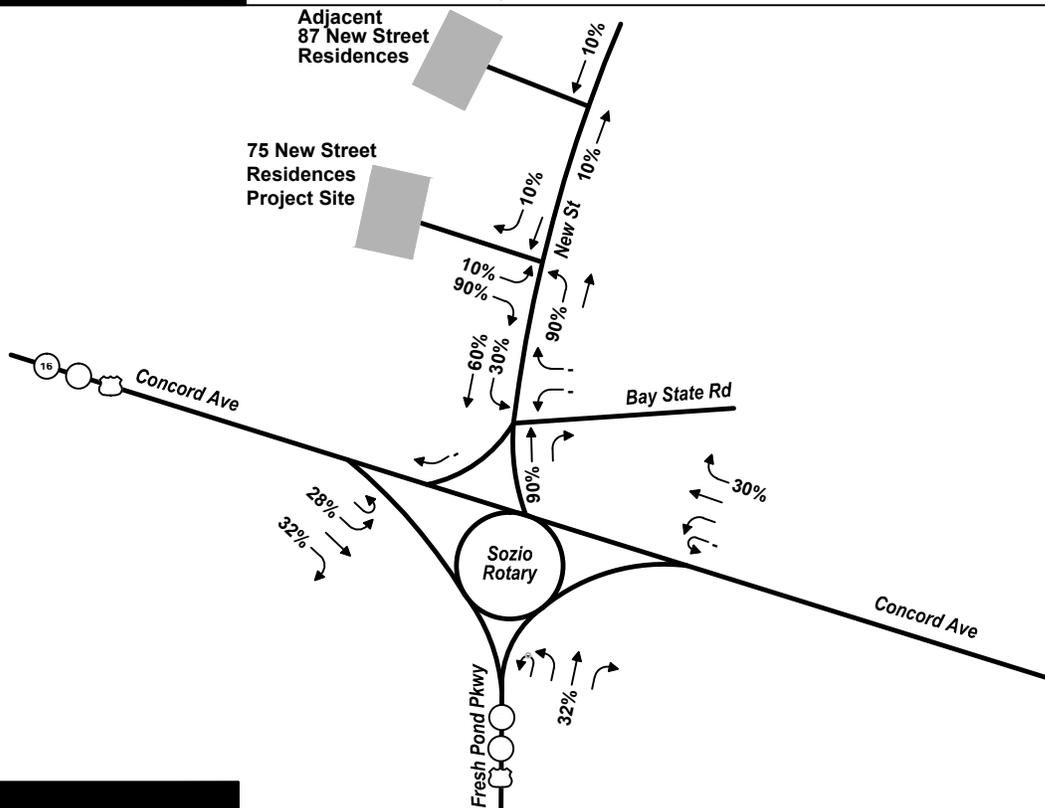
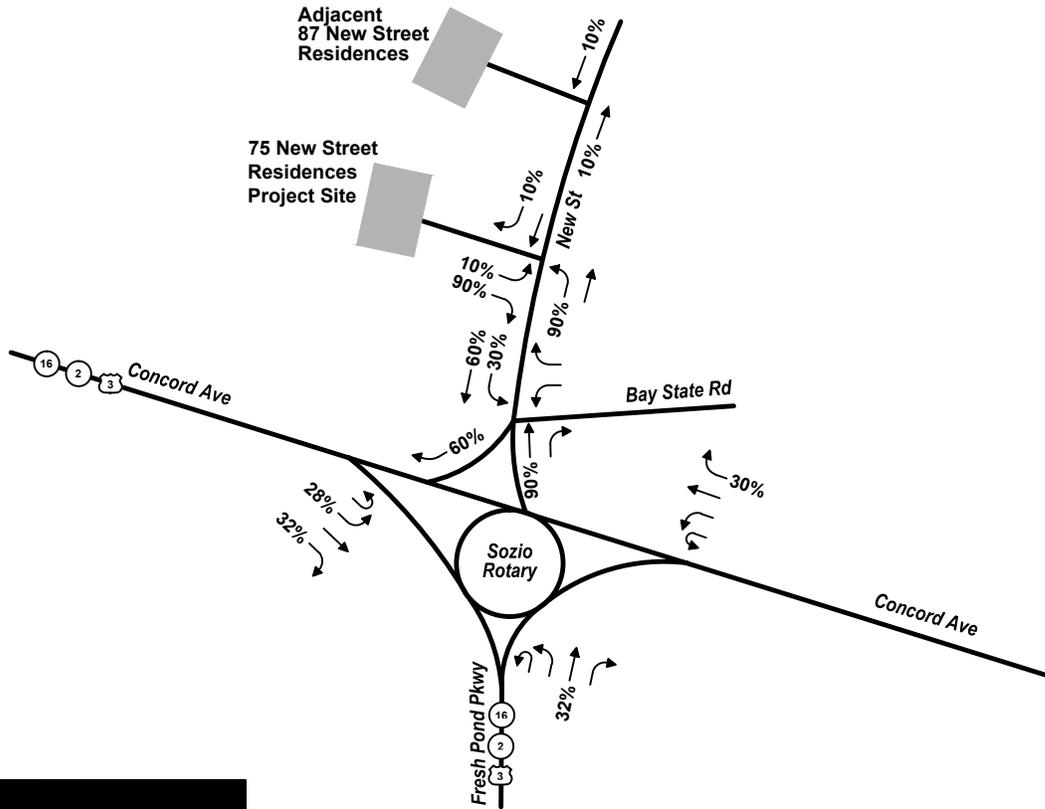


Weekday Evening Peak Hour

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Not to Scale

Existing (2013) Bicycle Volumes **Figure 2.c.3**
Counted 5/24/2012, 5/30/2012 and 9/12/2012
75 New Street Residences
Cambridge, Massachusetts

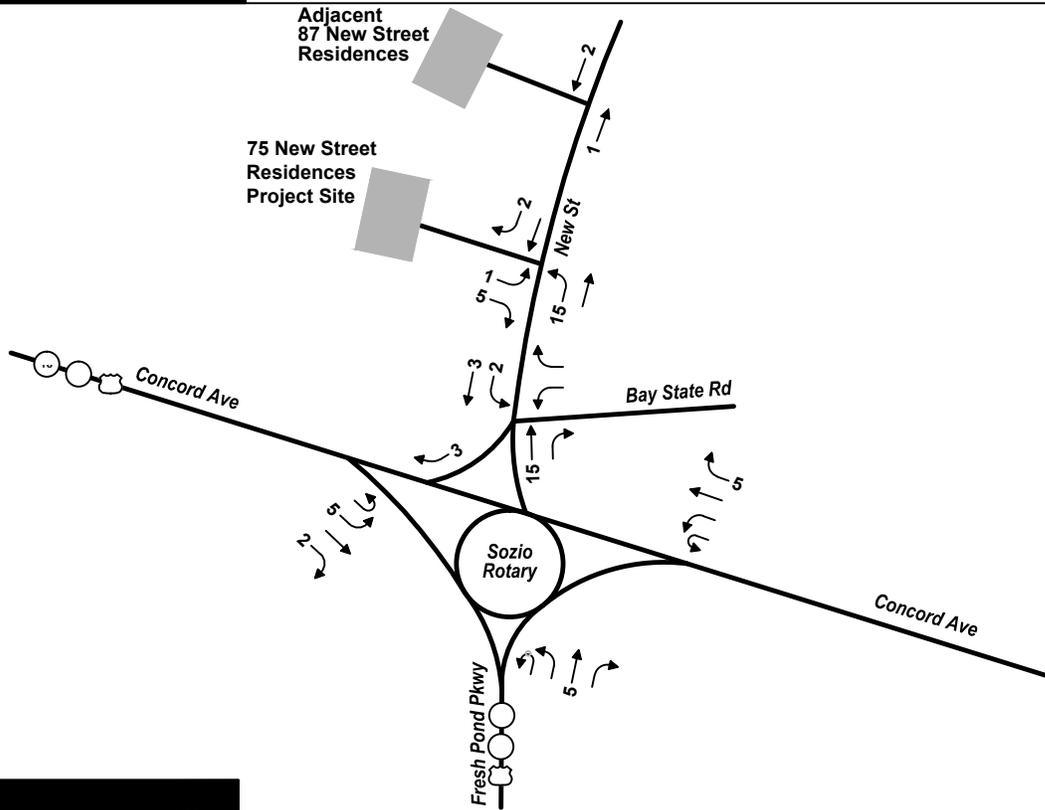
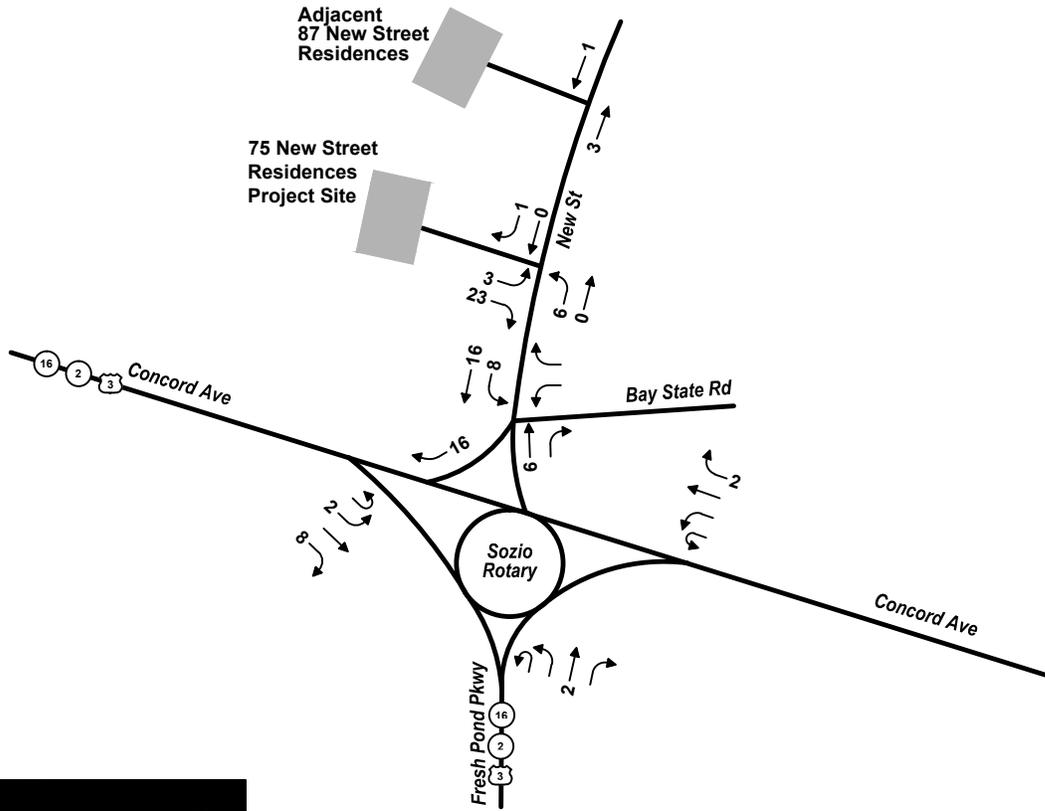




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Trip Distribution
75 New Street Residences
Cambridge, Massachusetts

Figure 3.d.2

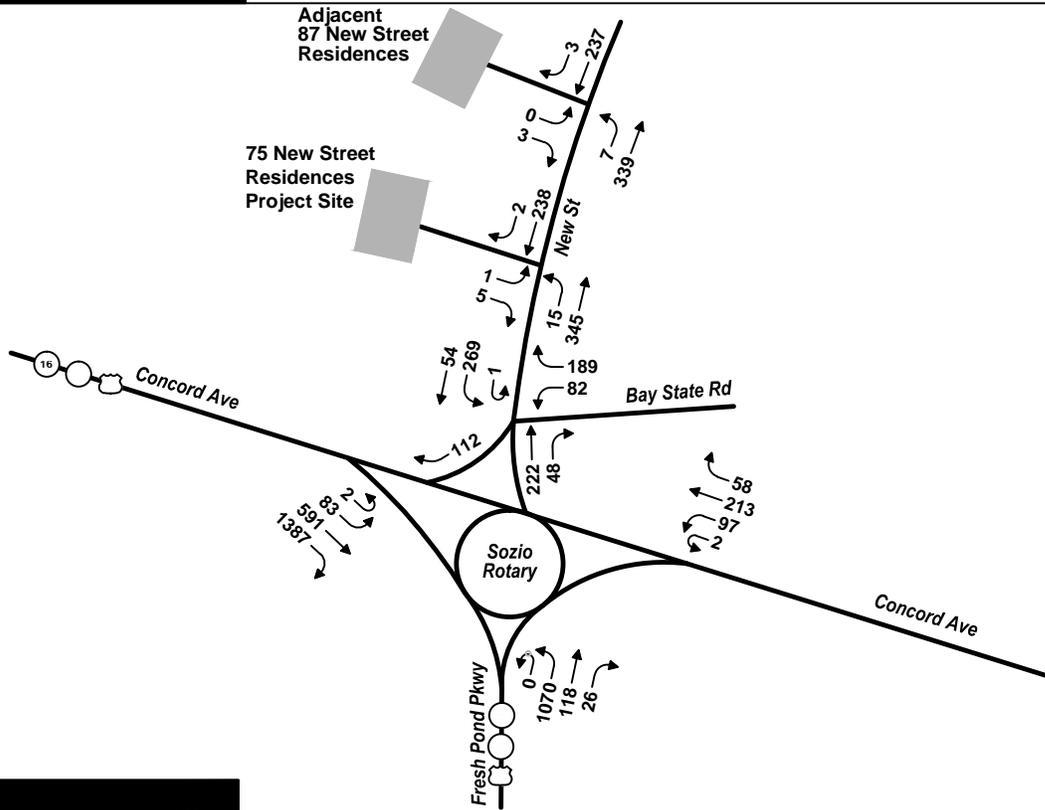
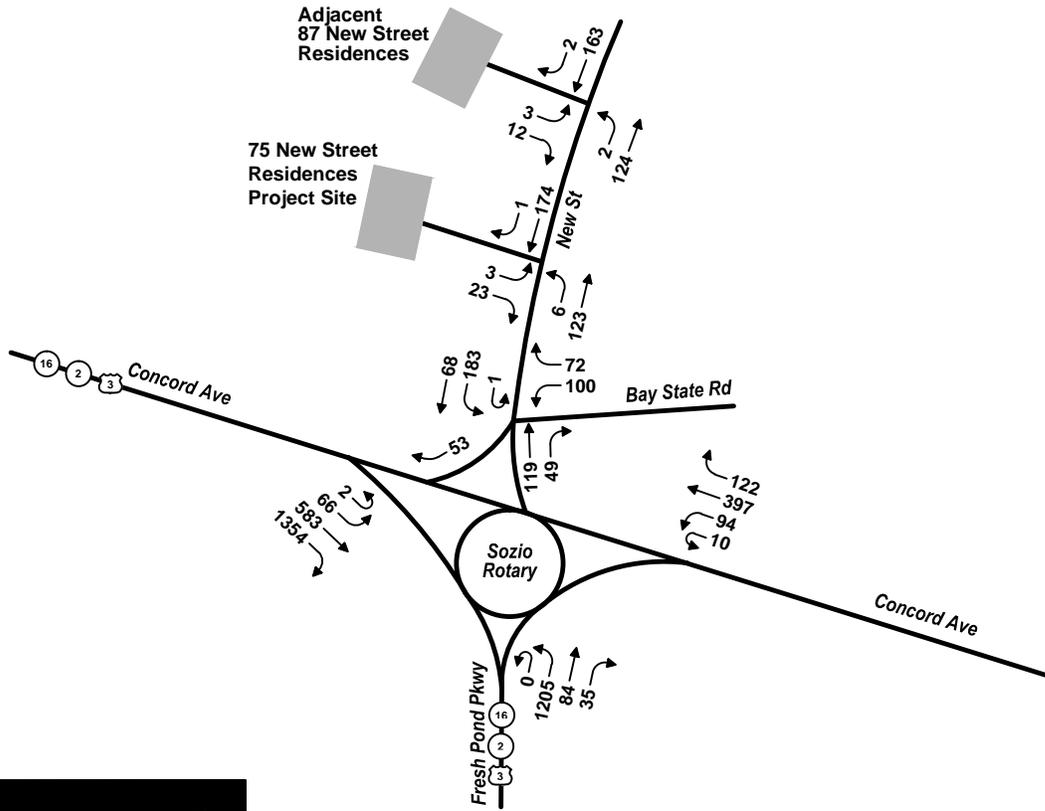


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Project Generated Trips

Figure 3.d.3

75 New Street Residences
Cambridge, Massachusetts

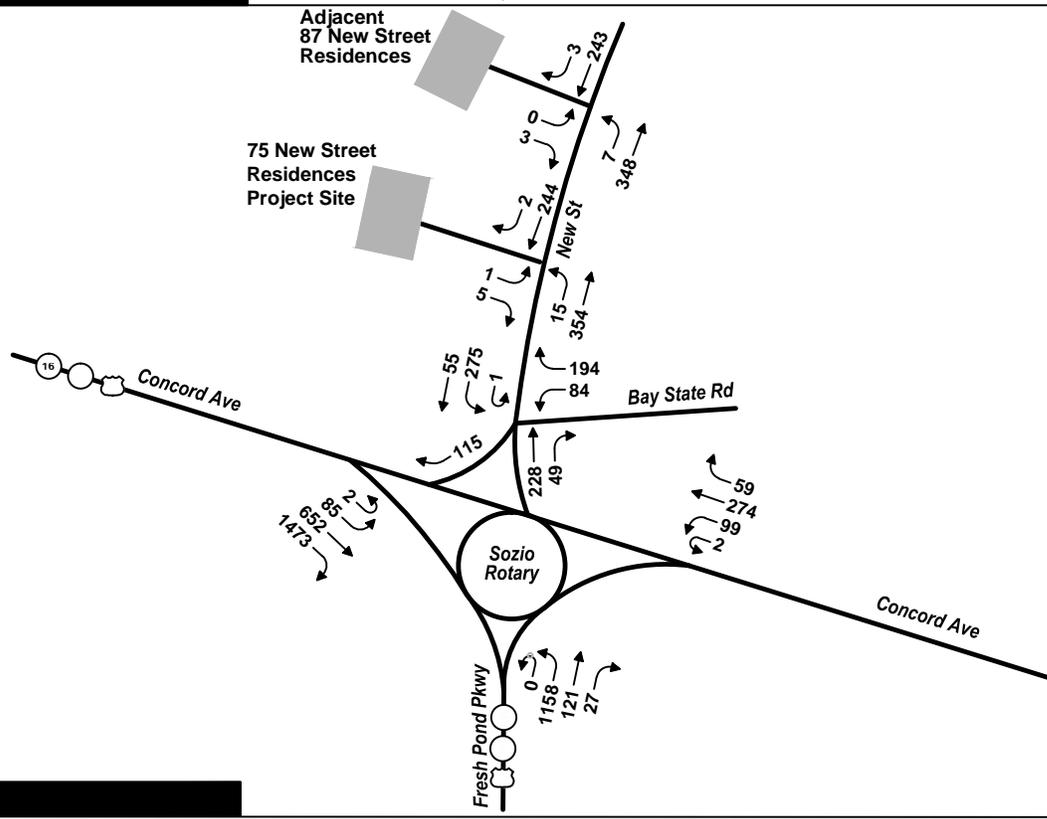
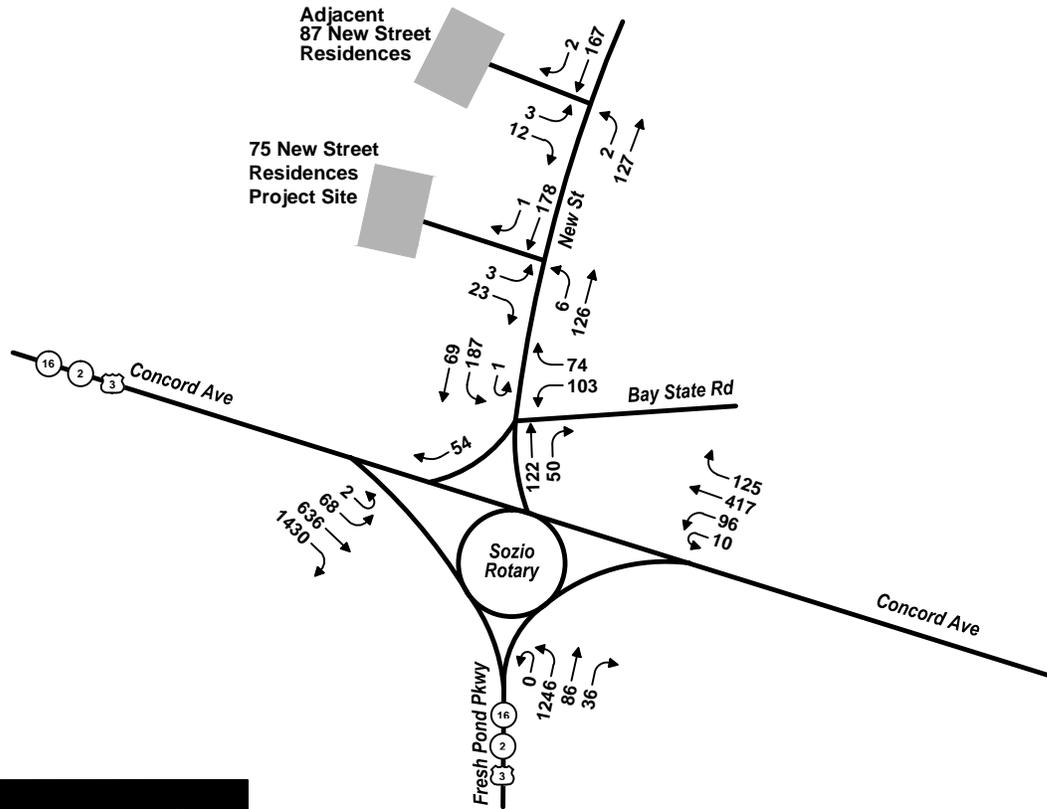


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Build (2013) Traffic Volumes

Figure 5.b.1

75 New Street Residences
Cambridge, Massachusetts



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Not to Scale

Future (2018) Traffic Volumes

Figure 5.c.1

75 New Street Residences
Cambridge, Massachusetts



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