PRELIMINARY DEVELOPMENT PLAN

Volume III

Healthpeak PUD Master Plan
Cambridge, Massachusetts

March 2026

Submitted to:
City of Cambridge

Submitted by:
Healthpeak OP, LLC
1900 Main Street, Suite 500
Irvine, CA 92614

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Volume III: Preliminary Development Plan

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Appendix A

Transportation Impact Study

(TIS Appendix is available upon request)

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TRANSPORTATION IMPACT STUDY

Healthpeak PUD Special Permit

Cambridge, Massachusetts

PREPARED FOR

Healthpeak OP, LLC
1900 Main Street, Suite 500
Irvine, CA 92614

PREPARED BY

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January 6, 2026
REVISED on February 5, 2026

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Introduction & Project Overview

On behalf of Healthpeak OP, LLC (the "Proponent"), VHB, Inc. has conducted a Transportation Impact Study ("TIS") for the proposed Healthpeak mixed-use redevelopment in Cambridge, Massachusetts. The TIS considers the development of a mixed-use series of buildings inclusive of technical office/lab, residential, and retail/neighborhood uses totaling 4,825,000 square feet ("SF") of Gross Floor Area (the "Project"). The Project will take place on approximately 42 acres (the "Site") within the Alewife Quadrangle area (the "Quad"). The buildings will be supported by approximately 4,578 vehicle parking spaces, 3,076 long-term bicycle parking spaces and 440 short-term bicycle parking spaces.

The TIS responds to the scope dated December 6, 2024, as defined by the City of Cambridge's Department of Transportation ("the City DOT") fka Traffic, Parking and Transportation ("TP&T") Department[1] in response to VHB's Request for Scoping dated September 30, 2024. Copies of the City's Scoping Determination and VHB's Request for Scoping are included in Appendix A for reference.

The TIS has been prepared in conformance with the current City of Cambridge guidelines for Transportation Impact Studies, as well as the Supplemental/Updated TIS Guidelines, as required under Article 19 Special Permit Project Review.

This document is comprised of three components, as follows:

- **Introduction and Project Overview** – describing the framework in which the transportation component of this Project was evaluated.
- **TIS** – presenting the technical information and analysis results as required under the guidelines; and,
- **Planning Board Special Permit Criteria** – summarizing the evaluation of the Project as defined under the TIS guidelines.

The required TIS Summary Sheets and Planning Board Criteria Performance Summary are also included. Supplementary data and analysis worksheets are provided in the Appendix. Electronic files for automatic traffic recorder ("ATR") counts, Turning Movement Counts ("TMCs"), and Synchro/SimTraffic/SIDRA analyses are included in an accompanying file.

[1] On April 1, 2025, the Traffic, Parking, + Transportation Department became the Department of Transportation, merging with the Community Development Department's Transportation Planning Division.

Project Overview

The Project includes the redevelopment of the approximately 42-acre Quad area to create a vibrant mixed-use district of first-class office/laboratory uses, retail/neighborhood uses, with significant components of residential and open space uses. The development will encourage strong connections between the Quad and other neighborhoods. The Site is bounded by Concord Avenue to the south, the Cambridge Highlands residential neighborhood, including Griswold Street, Loomis Street, and Normandy Avenue, to the west, the Massachusetts Bay Transportation Authority ("MBTA") commuter rail (Fitchburg Line) tracks to the north, and Wheeler Street to the east.

The Project will include the mixed-use development of eight commercial buildings, seven residential buildings, four stand-alone parking garages, totaling 4,825,000 SF. Three existing buildings will also be included in the development plan. The buildings will be supported by approximately 4,578 vehicle parking spaces and over 3,518 bike parking spaces (3,076 long-term and 440 short-term spaces). As part of the Project, the Proponent will provide an alternative location at the Site within which the City of Cambridge Department of Public Works ("DPW") can relocate its existing office and yard (collectively, the "DPW Yard").

Figures listed below illustrate details of the Project program:

- **Figure A** – a site context map
- **Figure B** – neighborhood context map
- **Figure C.a** – the existing conditions site survey
- **Figure C.b** – the existing parcel map and lot numbers
- **Figure D.a** – the proposed site plan
- **Figure D.b** – the proposed parcel map and lot numbers
- **Figure E.a** – the access and circulation scheme - pedestrians
- **Figure E.b** – the access and circulation scheme – bicycles
- **Figure E.c** – the access and circulation scheme – vehicles
- **Figure E.d** – the access and circulation scheme – loading/trucks
- **Figure E.e** – the potential future transit services including TMA stop locations
- **Figure F** – the Study Area Intersections
- **Figure G.a - G.ba** – Proposed Vehicular Parking
- **Figure H.a – H.as** – the proposed bicycle parking layout

Table A provides a summary of the proposed development program. Table B summarizes the Proposed Project by parcel and land use. As requested in the Scoping Determination, where the data was known or available, parcel addresses, parcel Map-Lot numbers, building and land uses, and the number of automobile parking spaces, short-term bicycle parking spaces, and long-term bicycle parking spaces are listed.

Table A Summary of Proposed Program

Project Component	Size[1] / Quantity	Existing To Remain
Building Use		
Technical Office/Lab	±1,260,500 SF[2]	NA
General Office	±1,310,500 SF[2,3]	±109,000 SF
Residential	±1,985,000 SF (2,296 units)[4]	NA
Retail/Neighborhood Use	±71,000 SF	±89,000 SF
TOTAL	**±4,627,000 GFA (net new)** **±4,825,000 GFA[5] (total)**	**±198,000 GFA[5]**
Parking		
Vehicle Parking Supply	Up to 3,927 spaces (new) **Up to 4,578 spaces[6] (total)**	651 spaces[6] (existing to remain)
Bicycle Parking Supply[7]	±3,076 long-term (interior) spaces ±440 short-term (exterior) spaces **Up to 3,516 spaces[7] (total)**	

1. As used in this Table, "square feet" represent square feet of Gross Floor Area ("GFA"), as such term is defined in Article 2.000 of the City of Cambridge Zoning Ordinance
2. Assumes 50% General Office and 50% Technical Office/Lab use for all buildings. Except for DPW Yard.
3. DPW Yard - Includes approximately 20,000 SF of General Office use and 30,000 SF of storage space in connection with the DPW Yard Project, which is anticipated to be exempt GFA pursuant to Section 20.1100.5.1.4.1(a).
4. Assumes an average of 865 SF per dwelling unit. A mix of unit sizes is anticipated for the project. As buildings get designed, actual per unit SF will be provided in future city filings.
5. Includes building area to remain: 109,000 SF of office use at 10 Fawcett Street, 84,500 SF of medical office use at 725 Concord Avenue and 4,500 SF of retail use at 110 Fawcett Street.
6. Includes a total of approximately 651 existing parking spaces to remain (approximately 359 spaces at 725 Concord Avenue, 254 spaces at 10 Fawcett Street, 20 spaces at the DPW Parcel, 10 spaces within an easement parcel adjacent to 725 Concord Avenue and 8 spaces at 110 Fawcett Street).
7. Bicycle Parking Guide 2013 (cambridgema.gov); assumed average of retail and restaurant rates for active use SF.

The Proponent has acquired approximately 42 acres of land within the Quad, including the 24 parcels listed in Table B. The existing structures on the land, as listed in Table C, will be demolished to allow for the proposed redevelopment. The existing land uses are comprised of office and industrial uses, as well as some open space uses and one unoccupied single-family home.

As requested in the TIS Scoping Determination, where the data was known or available, parcel addresses, parcel Map-Lot numbers, building and land uses, percent occupancy, number of employees, and number of automobile parking spaces are listed in Table C. Short-term and long-term bicycle parking spaces are generally not available at the sites. The existing parcel map and lot numbers are also shown in Figure C.b.

Table B Proposed Program by Parcel

Bldg #	Existing Use to Remain SF[4]	Residential Use SF (units)	Technical Office/Office Use SF[1,2]	Retail/ Neighborhood Use SF	Vehicle Parking Spaces Proposed Supply	Vehicle Parking Spaces Proposed Location	Min. Long-Term Bike Parking Spaces[6]	Min. Short-Term Bike Parking Spaces[6]	*Notes:*
C1			294,000			Park in P1/P2	76	18	
C2			294,000			Park in P1/P2	76	18	
C3			294,000			Park in P1/P2	76	18	
C4			288,000	7,000		Park in P1/P2	76	23	
C5			292,000			Park in P1/P2	76	18	
C6			301,000			Park in P1/P2	78	18	
C7			380,000	9,000		Park in P3	100	30	
C8			378,000	9,000		Park in P3	100	30	
R1		171,000 (201)			160	R1	210	20	Provides on-site parking
R2		379,000 (446)		7,000	330	R2	468	50	Provides on-site parking
R3		339,000 (399)		25,000	320	R3	422	60	Provides on-site parking
R4		311,000 (366)		14,000	300	R4	385	48	Provides on-site parking
R5		211,000 (248)			170	R5	259	25	Provides on-site parking
R6		52,000 (61)				Park in P4	63	6	
R7		302,000 (355)				Park in P4	372	36	
R8		220,000 (220)			165	R8	230	22	Provides on-site parking
P1					620	P1	-	-	Parking Garage
P2					859	P2	-	-	Parking Garage
P3					996	P3	-	-	Parking Garage
P4					630	P4	-	-	Parking Garage
E1	84,500					Park in P4	Existing	Existing	Existing Medical Bldg.
E2	4,500				8	E2	Existing	Existing	Existing Retail
E3	109,000					Park in P3	Existing	Existing	Existing Office Bldg.
DPW			50,000[2]		20	Future DPW Yard	6	1	DPW Yard Project
Total	**198,000 SF[4]**	**1,985,000 SF (2,296)[3]**	**2,571,000 SF**	**71,000 SF**	**4,578 spaces[5]**		**3,076 spaces[6]**	**440 spaces[6]**	
			Grand Total 4,825,000 SF						

1. Assumes 50% General Office and 50% Technical Office/Lab use for all buildings. Except for DPW Yard.
2. DPW Yard - Includes approximately 20,000 SF of General Office use and 30,000 SF of storage space in connection with the DPW Yard Project, which is anticipated to be exempt GFA pursuant to Section 20.1100.5.1.4.1(a).
3. Assumes an average of 865 SF per dwelling unit. A mix of unit sizes is anticipated for the project. As buildings get designed, actual per unit SF will be provided in future city filings.
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5. Includes a total of approximately 651 existing parking spaces to remain (approximately 359 spaces at 725 Concord Avenue, 254 spaces at 10 Fawcett Street, 20 spaces at the DPW Parcel, 10 spaces within an easement parcel adjacent to 725 Concord Avenue and 8 spaces at 110 Fawcett Street).
6. Bicycle Parking Guide 2013 (cambridgema.gov); assumed average of retail and restaurant rates for active use SF.

Table C Summary of Existing Buildings

Parcel Map-Lot #	Location/Address	Alternate Address	Land Use	Building Size (SF)	Approx.% Occupied	Employees
267.3-226	13 Mooney St	15 Mooney St	Industrial/Warehouse	34,570	0%	0
267.3-279	45 Mooney St	45R Mooney St	Industrial/Warehouse	53,400	64%	87
267.3-280	50 Mooney St					
267.3-276	61 Mooney St					
267.3-278	67 Mooney St	51 Mooney St				
267.3-268	52 Mooney St		Land	-	-	-
267.3-277	54 Mooney St		Land	-	-	-
267F-274	617 Concord Ave		Parking Lot	-	-	-
267F-293	625 Concord Ave	10 Moulton St	Office	95,148	100%	179
267E-242	641 Concord Ave	643 Concord Ave	Residential	2,916	0%	0
267.E-17	645 Concord Ave		Land	-	-	-
267D-311	689 Concord Ave	691 Concord Ave	Office	4,056	0%	0
267F-283	77 Fawcett St		Office	34,482	100%	64
267.4-209; 267.4-210	125 Fawcett St	115, 125, 131 and 135 Fawcett St	Office	35,617	50%	13
267.4-295	180A Fawcett St	144 and 146 Smith Pl	Industrial/Warehouse	12,942	100%	24
267.4-321	78R Cambridgepark Dr		Land	-	-	-
267F-391	12 Moulton St	22 and 50 Moulton St; 67 Fawcett St	Office	90,247	100%	169
267F-279	24 Moulton St					
267F-281	36 Moulton St					
267F-291	60 Moulton St		Parking Lot	-	-	-
267F-295	62 Moulton St		Parking Lot	-	-	-
267F-296	68 Moulton St		Office	23,177	85%	62
267D-258	11 Smith Pl		Land	–	-	0
267D-256	25 Smith Pl		Industrial/Warehouse	7,386	0%	0
267E-294	26 Smith Pl		Land	-	-	-
267D-313; 267D-335	35 Smith Pl		Parking Lot	-	-	-
267D-325	49 Smith Pl	47 Smith Pl	Parking Lot	-	-	-
267D-293	59 Smith Pl		Parking Lot	-	-	-
267C-95	61-67 Smith Pl	Incl 3 buildings	Industrial	52,943	25%	17
267.4-254	100 Smith Pl		Industrial/Warehouse	46,666	100%	86
267.3-228	127 Smith Pl	20 and 30 Mooney St	Industrial/Warehouse	57,521	50%	11
267C-91	60 Loomis St		Land	-	-	-
267.4-247	110 Fawcett St		Retail	4,800	n/a	n/a
267.4-284	160 Fawcett	180 Fawcett St	Industrial/Warehouse	38,028	0%	0
		Total (to be removed)		**593,899**	**55%**	**826**
267D-285	725 Concord Ave		Medical Office	84,500	n/a	n/a
267F-301	10 Fawcett St	591 Concord Ave	Office	109,000	n/a	n/a
267.4-247	110 Fawcett St		Retail	4,500	n/a	n/a
		Total (to remain)		**198,000**	**-**	**-**
		Grand Total SF (remove + remain)		***791,899***		

The Project Site is accessed via existing streets that intersect Concord Avenue including Smith Place, Moulton Street, Fawcett Street, and Wheeler Street. The Project will also have access from New Main Street in the future, a new roadway that connects from Concord Avenue south of the Site and Wilson Road north of the Site. Each building is designed with its own loading dock; several buildings also propose on-site parking, with some buildings sharing and utilizing pooled parking within proposed stand-alone parking garages at the Project.

Proposed Bridge over MBTA Commuter Rail Tracks

An essential element of the Project is the construction of a new bridge (the "Proposed Bridge") over the MBTA commuter rail tracks that will provide a long-awaited connection between the Quad and the Alewife Triangle / Alewife MBTA Station to the north. The proposed bridge will accommodate pedestrians and cyclists. The Proposed Bridge is not intended to preclude any future MBTA right-of-way work or commuter rail expansion projects.

Under the Existing Conditions, most of the Quad, particularly sites located west of Wheeler Street, experience a walk time from the Quad to the Alewife MBTA Station of approximately 15-20 minutes (3/4 mile to 1 mile). With the Proposed Bridge in place, most of the Quad would experience a walk time from the Quad to the Alewife MBTA Station of about 8-15 minutes on average (1/2 mile to 3/4 mile). It is anticipated that the Proposed Bridge would result in a savings of approximately 5-7 minutes, depending on where in the Quad the pedestrian originates their trip.

Schedule of Proposed Bridge Implementation

The timing for the Proposed Bridge will be in accordance with the Cambridge Infrastructure Planned Unit Development (PUD) requirements of the AOD-Q. Construction shall commence before the issuance of a certificate of occupancy for over 50% of the non-residential GFA and will be substantially completed before the issuance of a certificate of occupancy for over 75% of the non-residential GFA of an approved Final Development Plan.

Proposed Bridge Design

While subject to approval by the MBTA, the Proposed Bridge, as currently contemplated, would span over the railroad with a minimum vertical clearance of 20 feet 8 inches above the MBTA commuter rail tracks. The Proposed Bridge would provide a staircase on each end, as well as accessible ramps with appropriate ADA-compliant ramp slopes.

The current placement of the Proposed Bridge is not intended to preclude any future MBTA right-of-way work or commuter rail expansion projects.

Healthpeak and the MBTA evaluated multiple bridge locations and collectively came to the decision to pursue this location since it eliminated the need to engage any other third-party property owners. A Cambridgepark Drive connection is being considered through privately owned land that is currently eased for public access. This will require engagement and/or contributions from multiple stakeholders including adjacent landowners, the MBTA, and the City to determine the specifics around the exact path, quality, and type of sidewalks/pathways and its implementation. Feedback from the community highlighted the importance of bicyclists not having to dismount to traverse the bridge and connection to the 140 Cambridgepark Drive parking structure, as proposed in earlier filings for that site, would have made that difficult.

TIS Study Area

The TIS study area for the Project, as defined by the City DOT, is shown in Figure F, and includes the following intersections:

1. Concord Avenue at Blanchard Road/Griswold Street (signalized)
2. Concord Avenue at Spinelli Place (unsignalized)
3. Concord Avenue at Smith Place (unsignalized)
4. Concord Avenue at Moulton Street (signalized)
5. Concord Avenue at Fawcett Street (signalized)
6. Concord Avenue at Wheeler Street (unsignalized)
7. Concord Avenue at Alewife Brook Parkway/Concord Avenue (rotary)
8. Concord Avenue at Fresh Pond Parkway/Concord Avenue (rotary)
9. Concord Avenue at Walden Street (signalized)
10. Concord Avenue at Huron Avenue (signalized)
11. Concord Avenue at Garden Street (signalized)
12. Fresh Pond Parkway at Huron Avenue (signalized)
13. Alewife Brook Parkway at Terminal Road/Fresh Pond Mall (signalized)
14. Alewife Brook Parkway at Rindge Avenue (signalized)
15. Alewife Brook Parkway at Cambridgepark Drive (signalized)
16. Alewife Brook Parkway at Concord Turnpike (Route 2) (signalized)
17. Massachusetts Avenue at Alewife Brook Parkway (signalized)
18. Rindge Avenue at Sherman Street (signalized)
19. Garden Street at Walden Street (signalized)
20. Garden Street at Sherman Street at Huron Avenue (signalized)

Planning Board Criteria Summary

The Project has been evaluated within the context of the Planning Board Criteria (the "Criteria") to determine whether 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 Criteria consider the Project's vehicular trip generation, impact to intersection level of service and vehicle queuing, as well as increase of traffic volume on residential streets. In addition, the Criteria consider walking and bicycling conditions. The Planning Board Criteria Performance Summary is presented below; further discussion of the Criteria set forth by the Planning Board is presented in the last section of this TIS report.

The Project has an estimated 107 exceedances out of 363 total data entries.

- 3 exceedances pertain to Project trip generation, see Table Criteria A-1.
- 20 exceedances pertain to vehicle Level of Service ("LOS"), see Table Criteria B-2.
- 20 pertain to traffic on residential streets, see Table Criteria C-2.
- 13 pertain to vehicular queues, see Table Criteria D-2.
- 51 pertain to pedestrian LOS, see Table Criteria E-1.

PROJECT	
Project Name:	Healthpeak PUD Special Permit
Project Address:	Multiple Addresses Cambridge, MA 02138
Owner/Developer:	Healthpeak OP, LLC
Contact Person:	Rylan Squirrell
Contact Address:	1900 Main Street Suite 500 Irvine, CA 92614
Contact Phone Number:	(949) 407-0700

SIZE	
ITE sq. ft.:	4,825,000 GFA
Land Use Type:	Mixed Use Development – Residential, Technical Office/Lab, General Office, and Retail/Neighborhood Uses

PARKING		
Existing Parking Spaces:	1,290 surface parking spaces (639 to be removed, 651 to be maintained)	Building Use: Office + Industrial
Proposed Parking Spaces:	4,578 parking spaces (including 651 existing maintained)	Building Use: Residential, General Office, Technical Office/Lab + Retail/Neighborhood Use
Net New Parking Spaces:	3,288 spaces	*(compared to existing)*

TRIP GENERATION	Morning Peak Hour	Evening Peak Hour
Vehicle (*Net-New)*	1,538	1,583
Transit	883	945
Walk	299	347
Bicycle	224	226
Micromobility	17	18
Telecommuting	953	926

MODE SPLIT (Share of Person Trips)	Residential Use	Technical Office/ General Office Use	Retail/Neighborhood Use
SOV	31.8%	40.0%	30.0%
HOV	4.7%	4.4%	7.2%
Transit	29.2%	17.8%	28.9%
Walk	8.5%	6.3%	25.1%
Bike	3.8%	6.3%	6.4%
Micromobility	0.5%	0.4%	0.5%
Telecommuting	21.5%	24.8%	1.8%

TRANSPORTATION CONSULTANT	
Company Name:	VHB
Contact Name:	Selma Mandzo-Preldzic, PE
Contact Phone Number:	617-607-2943
Date of Building Permit Approval:	TBD

Planning Board Criteria

Total Data Entries = 363 Total Number of Criteria Exceedances = 107

Criteria A – Project Vehicle Trip Generation

Period	Criteria (trips)	Build (trips)	Exceeds Criterion?
Weekday Daily	2,000	15,732	Yes
Weekday Morning Peak Hour	240	1,538	Yes
Weekday Evening Peak Hour	240	1,583	Yes

Criteria B – Vehicular LOS

Intersection	Morning Peak Hour				Evening Peak Hour			
	Existing Condition	Build Condition	Traffic Increase	Exceeds Criterion?	Existing Condition	Build Condition	Traffic Increase	Exceeds Criterion?
Concord Avenue at Blanchard Road/ Griswold Street	F	F	42%	Yes	E	F	48%	Yes
Concord Avenue at Spinelli Place*	B	D	n/a	No	A	C	n/a	No
Concord Avenue at Smith Place*	A	E	n/a	Yes	A	E	n/a	Yes
Concord Avenue at Moulton Street	A	B	n/a	No	B	C	n/a	Yes
Concord Avenue at Fawcett Street	B	F	n/a	Yes	B	F	n/a	Yes
Concord Avenue at Wheeler Street*	A	B	n/a	No	A	B	n/a	No
Concord Avenue at Alewife Brook Parkway*	F	F	23%	Yes	F	F	26%	Yes
Concord Avenue at Fresh Pond Parkway*	F	F	9%	Yes	F	F	11%	Yes
Concord Avenue at Walden Street	C	C	n/a	No	C	C	n/a	No
Concord Avenue at Huron Avenue	E	E	7%	No	D	E	7%	Yes
Concord Avenue at Garden Street	C	C	n/a	No	C	D	n/a	No
Fresh Pond Parkway at Huron Avenue	F	F	4%	No	F	F	4%	No
Alewife Brook Parkway at Terminal Road/ Fresh Pond Mall	B	E	n/a	Yes	B	B	n/a	No
Alewife Brook Parkway at Rindge Avenue	E	F	16%	Yes	F	F	15%	Yes
Alewife Brook Parkway at Cambridgepark Dr	D	E	14%	Yes	E	F	13%	Yes
Alewife Brook Parkway at Concord Turnpike (Route 2)	E	E	8%	Yes	D	E	8%	Yes
Massachusetts Avenue at Alewife Brook Parkway	F	F	6%	Yes	F	F	5%	No
Rindge Avenue at Sherman Street	C	C	n/a	No	C	C	n/a	No
Garden Street at Walden Street	D	D	0%	No	C	C	n/a	No
Garden Street at Sherman Street at Huron Avenue	E	E	1%	No	D	D	1%	No

Criteria C – Traffic on Residential Streets

			Morning Peak Hour			Evening Peak Hour		
Roadway	Segment	Amount of Residential	Existing[1]	Increase[2]	Exceeds Criterion?	Existing[1]	Increase[2]	Exceeds Criterion?
Concord Avenue	Hamilton Road to Blanchard Road/Griswold Street	1/2 or more	516	140	Yes	500	160	Yes
	Fayerweather Street to Walden Street	1/2 or more	935	105	Yes	980	120	Yes
	Walden Street to Appleton Street	1/2 or more	865	100	Yes	945	115	Yes
	Chauncy Street to Garden Street	>1/3 but <1/2	915	85	Yes	845	100	Yes
Blanchard Road	Merrill Avenue to Concord Avenue	1/2 or more	915	370	Yes	875	410	Yes
Griswold Street	Concord Avenue to Sunset Road	1/2 or more	47	0	No	39	0	No
Walden Street	Sherman Street to Garden Street	1/2 or more	795	5	No	896	5	No
	Garden Street to Fayerweather Street	1/2 or more	590	5	No	635	5	No
	Copley Street to Concord Avenue	1/2 or more	620	5	No	725	5	No
	Concord Avenue to Saville Street	1/2 or more	530	0	No	530	0	No
Huron Avenue	Cutler Ave to Garden Street/Sherman Street	1/2 or more	335	5	No	422	5	No
	Garden Street/Sherman Street to Daniel R Tierney Street	1/2 or more	555	5	No	695	5	No
	Fresh Pond Parkway to Larch Road	>1/3 but <1/2	690	0	No	750	0	No
	Larchwood Drive to Fresh Pond Parkway	1/2 or more	840	15	No	887	15	No
Garden Street	Ivy Street to Walden Street	1/2 or more	495	0	No	460	0	No
	Walden Street to Stearns Street	1/2 or more	280	0	No	161	0	No
	Winslow Street to Huron Avenue	1/2 or more	231	0	No	130	0	No
	Huron Avenue to Gray Gardens	1/2 or more	350	0	No	150	0	No
Rindge Avenue	Alewife Brook Parkway to Clifton Street	>1/3 but <1/2	730	80	Yes	780	80	Yes
	Clay Street to Sherman Street	1/2 or more	675	80	Yes	595	80	Yes
	Sherman Street to Reed Street/ Sargent Street	1/2 or more	710	70	Yes	460	65	Yes
Fresh Pond Parkway	Larch Road to Huron Avenue	1/2 or more	1,705	90	Yes	1,695	100	Yes
	Huron Avenue to Fresh Pond Lane	1/2 or more	1,615	75	Yes	1,572	85	Yes
Sherman Street	Rindge Avenue to Pemberton Street	1/2 or more	645	10	No	435	15	No
	Winslow Street to Huron Avenue	1/2 or more	351	0	No	377	0	No

1 Where driveways/on-street parking created a segment inflow/outflow volume imbalance, an average was calculated per direction and added.

2 Net new project trips after trip credits are applied.

Criteria D – Length of Vehicle Queues at Signalized Intersections

		Morning Peak Hour			Evening Peak Hour		
Intersection	Lane Group	Existing Condition	Build Condition	Exceeds Criterion?	Existing Condition	Build Condition	Exceeds Criterion?
Concord Avenue at Blanchard Road/ Griswold Street	Concord Avenue EB L/T	9	15	No	4	7	No
	Concord Avenue EB T/R	6	14	No	4	7	No
	Concord Avenue WB L	6	13	No	8	20	Yes
	Concord Avenue WB T	5	8	No	6	11	No
	Concord Avenue WB R	3	4	No	5	24	Yes
	Blanchard Road NB L/T	12	12	No	10	12	No
	Blanchard Road NB R	0	0	No	0	0	No
	Blanchard Road SEB L/T/R	26	49	Yes	12	18	No
Concord Avenue at Moulton Street	Concord Avenue EB L/T	3	31	Yes	2	6	No
	Concord Avenue EB T/R	3	31	Yes	2	6	No
	Concord Avenue WB L/T/R	4	8	No	4	14	No
	Driveway NB L/T/R	0	0	No	1	1	No
	Moulton Street SB L/T/R	1	3	No	3	5	No
Concord Avenue at Fawcett Street	Concord Avenue EB L/T	3	8	No	3	6	No
	Concord Avenue EB T	3	8	No	3	6	No
	Concord Avenue WB T/R	7	24	Yes	5	11	No
	Fawcett Street SB L/R	3	9	No	3	26	Yes
Concord Avenue at Walden Street	Concord Avenue EB L	1	1	No	3	3	No
	Concord Avenue EB T/R	10	11	No	11	15	No
	Concord Avenue WB L/T/R	7	9	No	10	11	No
	Walden Street NB L/T/R	6	6	No	7	7	No
	Walden Street SB L/T/R	11	11	No	8	8	No
Concord Avenue at Huron Avenue	Concord Avenue EB L/T/R	7	9	No	9	14	No
	Concord Avenue WB L/T/R	10	11	No	12	13	No
	Huron Avenue NB L/T/R	11	12	No	8	9	No
	Huron Avenue SB L/T/R	8	8	No	9	9	No
Concord Avenue at Garden Street	Concord Avenue SEB T	12	12	No	9	9	No
	Garden Street NB L/T	10	12	No	12	13	No
	Garden Street SB T	5	5	No	5	5	No
Fresh Pond Parkway at Huron Avenue	Huron Avenue EB L	2	2	No	2	2	No
	Huron Avenue EB T/R	29	30	No	18	18	No
	Huron Avenue WB L	0	0	No	1	1	No
	Huron Avenue WB T/R	6	6	No	8	8	No
	Fresh Pond Parkway NB L/T	11	12	No	11	12	No
	Fresh Pond Parkway NB T/R	11	12	No	11	12	No
	Fresh Pond Parkway SB L/T	16	17	No	14	16	No
	Fresh Pond Parkway SB T/R	16	17	No	13	15	No
Alewife Brook Parkway at Terminal Road/	Terminal Road EB R	0	0	No	2	3	No
	Fresh Pond Mall Driveway WB R	1	2	No	7	10	No

Fresh Pond Mall	Alewife Brook Parkway NB T	10	26	Yes	12	19	Yes
	Alewife Brook Parkway NB R	0	0	No	0	1	No
	Alewife Brook Parkway SB T	10	13	No	19	25	No
	Alewife Brook Parkway SB R	0	1	No	1	1	No
Alewife Brook Parkway at Rindge Avenue	Rindge Avenue WB L	6	9	No	3	4	No
	Rindge Avenue WB R	16	16	No	16	16	No
	Alewife Brook Parkway NB T/R	42	70	Yes	32	45	Yes
	Alewife Brook Parkway SB T	10	10	No	10	10	No
Alewife Brook Parkway at Cambridgepark Drive	Cambridgepark Drive EB L	2	2	No	2	2	No
	Alewife Brook Parkway NB L	5	5	No	4	3	No
	Alewife Brook Parkway NB T	5	5	No	5	6	No
	Alewife Brook Parkway SB T	20	27	Yes	33	44	Yes
Alewife Brook Parkway (ABP) at Concord Turnpike (Route 2)	Route 2 (Signal 16b) EB L	44	43	No	100+	100+	No
	Route 2 (Signal 16d) EB T	34	39	No	100+	100+	No
	Alewife Station Ramp (16c) WBT	3	3	No	6	5	No
	Alewife Station Ramp (16c) WBR	2	2	No	3	2	No
	ABP (Signal 16b) NB T	18	13	No	28	26	No
	ABP (Signal 16c) NB T	2	3	No	3	3	No
	ABP (Signal 16b) SB T	5	7	No	4	5	No
	ABP (Signal 16a) SB R	20	20	No	17	14	No
Massachusetts Avenue at Alewife Brook Parkway	Massachusetts Avenue EB L/T	11	11	No	6	6	No
	Massachusetts Avenue EB T	11	11	No	8	9	No
	Massachusetts Avenue EB R	6	6	No	4	5	No
	Massachusetts Avenue WB L	11	13	No	13	14	No
	Massachusetts Avenue WB L/T	10	12	No	14	14	No
	Massachusetts Avenue WB T/R	6	6	No	11	11	No
	Alewife Brook Parkway NB L	3	4	No	3	3	No
	Alewife Brook Parkway NB T	10	11	No	23	27	No
	Alewife Brook Parkway NB T/R	10	11	No	23	27	No
	Alewife Brook Parkway SB L	2	2	No	3	3	No
	Alewife Brook Parkway SB T	31	31	No	31	31	No
	Alewife Brook Parkway SB T/R	1	1	No	30	30	No
Rindge Avenue at Sherman Street	Rindge Avenue EB T/R	1	1	No	2	2	No
	Rindge Avenue WB L/T	8	10	No	6	7	No
	Sherman Street NB L/R	4	4	No	8	8	No
Garden Street at Walden Street	Garden Street EB L/T/R	5	5	No	6	6	No
	Garden Street WB L/T/R	1	1	No	1	1	No
	Walden Street NB L/T/R	3	3	No	7	7	No
	Walden Street SB L/T/R	12	12	No	8	8	No
Garden Street at Sherman Street at Huron Avenue	Garden Street EB L/T/R	9	9	No	3	3	No
	Huron Avenue NB L/T/R	6	6	No	12	12	No
	Huron Avenue SB L/T/R	10	11	No	8	8	No
	Sherman Street SEB L/T/R	11	11	No	4	4	No

Criteria E-1 Study Area Intersections PLOS Summary

Intersection	Crosswalk	Morning Peak Hour			Evening Peak Hour		
		Existing Condition	Build Condition	Exceeds Criterion?	Existing Condition	Build Condition	Exceeds Criterion?
Concord Avenue at Blanchard Road/ Griswold Street	East	F	F	Yes	E	E	Yes
	West	F	F	Yes	E	E	Yes
	North	F	F	Yes	E	E	Yes
	South	F	F	Yes	E	E	Yes
Concord Avenue at Spinelli Place	East	D	F	Yes	F	F	Yes
	North	A	A	No	A	A	No
Concord Avenue at Smith Place	West	F	D	No	E	D	No
	North	A	D	Yes	A	D	Yes
Concord Avenue at Moulton Street	East	D	D	No	D	D	No
	North	D	D	No	D	D	No
Concord Avenue at Fawcett Street	West	D	D	No	D	D	No
	North	D	D	No	D	D	No
Concord Avenue at Wheeler Street	West	E	F	Yes	E	F	Yes
	North	A	A	No	A	A	No
Concord Avenue at Walden Street	East	C	C	No	C	C	No
	West	C	C	No	C	C	No
	North	B	B	No	B	B	No
	South	B	B	No	B	B	No
Concord Avenue at Huron Avenue	East	C	C	No	C	C	No
	West	C	C	No	C	C	No
	North	B	B	No	B	B	No
	South	B	B	No	B	B	No
Concord Avenue at Garden Street	Northwest	B	B	No	B	B	No
	South	D	D	No	D	D	No
Fresh Pond Parkway at Huron Avenue	East	E	E	Yes	E	E	Yes
	West	E	E	Yes	E	E	Yes
	North	E	E	Yes	E	E	Yes
	South	E	E	Yes	E	E	Yes
Alewife Brook Parkway at Terminal Road/Fresh Pond Mall	East	E	E	Yes	F	F	Yes
	West	E	E	Yes	F	F	Yes
	North	D	D	No	E	E	Yes
Alewife Brook Parkway at Rindge Avenue	East	E	E	Yes	E	E	Yes
	South	E	E	Yes	E	E	Yes
Alewife Brook Parkway at Concord Turnpike (Route 2)	East	E	E	Yes	E	E	Yes
Massachusetts Avenue at Alewife Brook Parkway	East	F	F	Yes	F	F	Yes
	West	F	F	Yes	F	F	Yes
	North	F	F	Yes	F	F	Yes
	South	F	F	Yes	F	F	Yes
Rindge Avenue at Sherman Street	East	D	D	No	D	D	No

Criteria E-1 Study Area Intersections PLOS Summary

Intersection	Crosswalk	Morning Peak Hour			Evening Peak Hour		
		Existing Condition	Build Condition	Exceeds Criterion?	Existing Condition	Build Condition	Exceeds Criterion?
	North	D	D	No	D	D	No
Garden Street at Walden Street	East	C	C	No	C	C	No
	West	C	C	No	C	C	No
	North	C	C	No	C	C	No
	South	C	C	No	C	C	No
Garden Street at Sherman Street at Huron Avenue	East	F	F	Yes	E	E	Yes
	West	F	F	Yes	E	E	Yes
	North	F	F	Yes	E	E	Yes
	Northwest	F	F	Yes	E	E	Yes
	South	F	F	Yes	E	E	Yes

Criteria E-2 – Pedestrian and Bicycle Facilities

Adjacent Street	Link (between)	Sidewalk or Walkway Present?	Exceeds Criteria?	Bicycle Facilities or Rights of Way Present?	Exceeds Criteria?
Concord Ave	Blanchard Road to Smith Place	Yes	No	Yes	No
	Smith Place to Moulton Street	Yes	No	Yes	No
	Moulton Street to Fawcett Street	Yes	No	Yes	No
	Fawcett Street to Wheeler Street	Yes	No	Yes	No

Transportation Impact Study

This TIS for the Project describes existing and future transportation conditions in the study area.

The TIS was conducted in accordance with the *City of Cambridge's Transportation Impact Study Guidelines, Sixth Revision (November 28, 2011)* and *Supplemental/Updated TIS Guidelines (March 30, 2020)*. The study area for the TIS includes fourteen (14) signalized intersections and six (6) unsignalized intersections (including two rotaries) (See Figure F).

This section includes inventories of physical and operational conditions in the study area including roadways, intersections, crosswalks, sidewalks, on-street and off-street parking, bicycle parking, transit facilities, and land uses in the study area. The section also presents the supporting transportation data that was collected and compiled, including intersection turning movement counts, pedestrian and bicycle counts, vehicle crash data, and transit service data.

1 Inventory of Existing Conditions

1.a Roadways + Pedestrian and Bicycle Connections

Roadways

The Project is sited within the Alewife Quadrangle neighborhood, with access from Concord Avenue as it intersects with Wheeler Street, Fawcett Street, Moulton Street, Smith Place, and Eastern States Road (secondary access road) as shown on Figure B. Most of the Site is bound by MBTA commuter rail tracks to the north, Concord Avenue to the south, residential neighborhoods to the west, and Alewife Brook Parkway to the east.

Concord Avenue is a principal arterial street generally running east-west that connects from Spring Street in Lexington, MA to Garden Street in Harvard Square.

Pedestrian + Bicycle Connections

South of Concord Avenue is Fresh Pond Reservation, which provides a series of trails and recreation land and consists of 162 acres of open space surrounding and protecting the 155-acre Fresh Pond water supply reservoir. Fresh Pond Perimeter Road (a multi-use trail) allows access for non-motorized vehicles and pedestrians.

The Watertown Cambridge Greenway travels east of Fresh Pond along Fresh Pond Parkway. At the south portion, the multi-use path continues west of Cambridge Cemetery and terminates at Arsenal Street in Watertown. To the north of Fresh Pond, the Watertown Cambridge Greenway connects to Concord Avenue providing portions of on-street bike lanes and limited grade-separated bike paths.

The Minuteman Commuter Bikeway provides approximately 11 miles of trail between the Alewife MBTA Station and Bedford, MA. The Alewife Linear Path provides a shared pathway for pedestrians and bicyclists adjacent to Alewife Station Access Road splitting westbound to Rindge Avenue/Clifton Street, and eastbound toward Massachusetts Avenue and Somerville.

The Alewife Linear Path has an average width of 6 feet. Located a short bike commute from the Quad is the Minuteman Commuter Bikeway, Fitchburg cut-off and Alewife Linear Path, all converging near the intersection of Steel Place and the Alewife Station Access Road, located just north of the Alewife MBTA Station.

Under the Existing Conditions, most of the Quad, particularly sites located west of Wheeler Street, lacks direct bike and pedestrian connections to major pathways and the Alewife MBTA station. Majority of sidewalks, if existent, are in poor condition and do not meet accessibility standards. Internal to the Quad, there are no dedicated bike facilities along the roadways. Currently, walk time from the Quad to the Alewife MBTA Station is at least 15-20 minutes (for 1 mile) and 12-15 minutes (for 3/4 mile) where multiple alternative modes converge including transit riders, bicyclists, and pedestrians.

The Quad also lacks appropriate wayfinding signage to direct pedestrians and bicyclists to nearby infrastructure and major multimodal hubs.

As part of the Project, the Proponent is committed to enhancing pedestrian and bike connections within the Quad to ensure safety and accessibility to users.

1.b Intersections

The Project study area includes the following twenty study intersections (See Figure F and the illustrations in Figures 1.b.1 through 1.b.20):

1. Concord Avenue at Blanchard Road/Griswold Street
2. Concord Avenue at Spinelli Place
3. Concord Avenue at Smith Place
4. Concord Avenue at Moulton Street
5. Concord Avenue at Fawcett Street
6. Concord Avenue at Wheeler Street
7. Concord Avenue at Alewife Brook Parkway/Concord Avenue (rotary)
8. Concord Avenue at Fresh Pond Parkway/Concord Avenue (rotary)
9. Concord Avenue at Walden Street
10. Concord Avenue at Huron Avenue
11. Concord Avenue at Garden Street
12. Fresh Pond Parkway at Huron Avenue
13. Alewife Brook Parkway at Terminal Road/Fresh Pond Mall
14. Alewife Brook Parkway at Rindge Avenue
15. Alewife Brook Parkway at Cambridgepark Drive
16. Alewife Brook Parkway at Concord Turnpike (Route 2)
17. Massachusetts Avenue at Alewife Brook Parkway
18. Rindge Avenue at Sherman Street
19. Garden Street at Walden Street
20. Garden Street at Sherman Street at Huron Avenue

1.c Parking

Vehicle Parking

The Proponent's acquired land within the Quad includes the parcels listed in Table C (in previous section). The existing structures on the land will be demolished to allow for the proposed redevelopment. The existing parcels, to be removed, contain approximately **639** counted parking spaces as documented in Table 1.c.1. Another 651 parking spaces from existing uses that are remaining will be preserved within the new parking facilities. Total existing parcels on site are counted as 1,290 spaces (639 existing spaces to be removed + 651 existing spaces to remain). Parking utilization data for these parking spaces is not known currently and not easily attainable due to a lack of count equipment/gate controls at the sites.

Table 1.c.1 Healthpeak Alewife Existing Parking Supply

Parcel Map-Lot #	Location/Address	Alternate Address	Land Use	Vehicle Parking Spaces*
267.3-226	13 Mooney St	15 Mooney St	Industrial/Warehouse	140
267.3-279	45 Mooney St	45R Mooney St	Industrial/Warehouse	10
267.3-280	50 Mooney St			
267.3-276	61 Mooney St			
267.3-278	67 Mooney St	51 Mooney St		
267.3-268	52 Mooney St		Land	
267.3-277	54 Mooney St		Land	
267F-274	617 Concord Ave		Parking Lot	
267F-293	625 Concord Ave	10 Moulton St	Office	30
267E-242	641 Concord Ave	643 Concord Ave	Residential	
267.E-17	645 Concord Ave		Land	
267D-311	689 Concord Ave	691 Concord Ave	Office	27
267F-283	77 Fawcett St		Office	34
267.4-209	125 Fawcett St	115, 125, 131 and 135	Office	55
267.4-210	Unkn/No address	Near 125 Fawcett	Land	
267.4-295	180A Fawcett St	144 and 146 Smith Pl	Industrial/Warehouse	76
267.4-321	78R Cambridgepark Dr		Land	
267F-391	12 Moulton St	22 and 50 Moulton St; 67 Fawcett St	Office	20
267F-279	24 Moulton St			
267F-281	36 Moulton St			
267F-291	60 Moulton St		Parking Lot	
267F-295	62 Moulton St		Parking Lot	
267F-296	68 Moulton St		Office	58
267D-258	11 Smith Pl		Land	
267D-256	25 Smith Pl		Industrial/Warehouse	
267E-294	26 Smith Pl		Land	
267D-313	35 Smith Pl		Parking Lot	
267D-325	49 Smith Pl	47 Smith Pl	Parking Lot	
267D-293	59 Smith Pl		Parking Lot	
267C-95	61-67 Smith Pl	Incl 3 buildings	Industrial	120

Parcel Map-Lot #	Location/Address	Alternate Address	Land Use	Vehicle Parking Spaces*
267.4-254	100 Smith Pl		Industrial/Warehouse	
267.3-228	127 Smith Pl	20 and 30 Mooney St	Industrial/Warehouse	43
267C-91	60 Loomis St		Land	
267.4-284	160 Fawcett St	180 Fawcett St	Industrial/Warehouse	26**
		Total (to be removed)		**639 counted**
267D-285	725 Concord Ave		Medical Office	359
267F-301	10 Fawcett St	591 Concord Ave	Office	254
267.4-247	110 Fawcett St		Retail	8
-	DPW Lot		Parking Lot	20
-	King Street Lot		Parking Lot	10
		Total (to remain)		**651 counted**
		Grand Total (removed and to remain)		***1,290 counted***

* Source: Aerial parking space count estimate based on striped spaces, unless otherwise noted.
** sp385_decision_20220505.pdf

On-Street Vehicle Parking

On-street parking is generally not permitted along Concord Avenue, Spinelli Place, Mooney Street, or Smith Place south of Wilson Road. Unregulated parking is available on Moulton Street, Wilson Road, and Smith Place north of Wilson Road. Accessible/HP parking is also available on the east side of Smith Place adjacent to Fawcett Street. Wheeler Street permits metered parking in the vicinity of Concord Avenue and Resident Permit Parking further north. Fawcett Street allows for Resident Permit Parking, 2-hour parking, unregulated parking, and Fire Department parking adjacent to Smith Place.

An estimate of the existing on-street vehicle parking count was conducted using aerial imagery. Counts included Smith Place, Fawcett Street and Moulton Street. Currently, there are approximately 93 on-street spaces provided on the counted streets within the Development Parcel. On-street parking regulations within the study area are illustrated in Figure 1.c.1.

Bicycle Parking

The quantity and occupancy data of long-term bicycle parking for employees and short-term bicycle parking for visitors and patrons of the existing parcels is unknown or not easily available, due to the land use nature of the sites (industrial, warehouse).

1.d Transit Services

Public Transit Services

Existing Massachusetts Bay Transportation Authority (MBTA) Transit Services

Bus and Rapid Transit Services

The Quad is served by two MBTA bus routes that operate along Concord Avenue: Routes 74 and Route 78.

The Alewife MBTA Station, the northern terminus for the MBTA Red Line, is within ¾-1 ¼-mile walk from the Project Site. (The tracks used by the Fitchburg commuter rail line separate the Project Site in the Quad from direct access to the Alewife MBTA Station, currently requiring a walk via Concord Avenue and Alewife Brook Parkway to access the station.) Bus routes that serve the Alewife MBTA Station include Routes 67, 62/76, and 350.

The Red Line rapid transit (subway) service operates between Alewife in Cambridge and Braintree or Ashmont (and Mattapan) in Boston. It serves the Cities of Cambridge, Quincy, Braintree, and the Boston neighborhoods of Downtown, South Boston, Dorchester, and Mattapan. The MBTA Red Line runs approximately every 7-10 minutes (within the trunk section) on weekdays. The span of service is from 5:15 AM to 12:30 AM.[2]

Transit stops and stations closest to the Site are shown in Figure 1.d.1. Daily weekday ridership, as well as operating hours and peak-hour headway data, are provided in Table 1.d.1 for the Red Line and area bus routes. (Additional information on ridership/activity levels and a detailed transit analysis is provided in Section 11 of this report.)

Table 1.d.1 MBTA Services (Existing Conditions)

Route	Origin/Destination	Weekday Service Period[1]	Average Weekday Ridership[2,3]	Weekday Peak Hour Headways
Concord Avenue Services				
Route 74	Belmont Circle – Harvard Station	5:10 AM – 1:28 AM	1,037	≈ 20–30 minutes
Route 78	Arlmont Village – Harvard Station	5:35 AM – 12:55 AM	1,143	≈ 25-35 minutes
Services at Alewife Station				
Route 62	Bedford V.A. Hospital – Lincoln R&D – Alewife Station	5:00 AM – 10:42 PM	726	≈ 20-30 minutes
Route 76	Bedford V.A. Hospital – Lincoln R&D – Alewife Station	6:25 AM – 7:50 PM	275	≈ 20-30 minutes
Route 67	Turkey Hill – Alewife Station	6:00 AM – 8:33 PM	332	≈ 30-40 minutes
Route 350	North Burlington – Alewife Station	5:44 AM – 11:08 PM	1,142	≈ 20-30 minutes
Red Line [4]	Alewife-Ashmont/Braintree Combined	5:15 AM – 12:30 AM	90,535 (Fall 2023) 93,025 (Fall 2024)	4-5 minutes

Sources:

1 MBTA Schedules, Fall 2025.

2 MBTA, Bus Composite Day data, Fall 2024. Total daily boardings.

3 Massachusetts Department of Transportation ("MassDOT") Mobility Dashboard, MBTA Rapid Transit Validations by Line, https://mobility-massdot.hub.arcgis.com. Average daily calculated from non-holiday weekdays, period of September, October, and through mid-November.

4 Ashmont/Braintree Ridership Data is combined, and it includes all Red Line boardings in both directions.

2 Winter 2024 Red Line Schedule. Schedules have been changing as the MBTA implements its capital and operational improvements, with an objective to return to 3.0-minute headways during peak periods.

Anticipated MBTA Transit Services

Bus Network Redesign

The MBTA is modifying bus service and routes in the area as part of the ongoing Bus Network Redesign Project.[3] The Bus Network Redesign Project modifies the MBTA bus network to align with planned development, change travel patterns, and provide more service. Upon full implementation, it will result in 25 percent more bus service systemwide and double the number of frequent bus routes (buses that operate on headways of 15 minutes or less). Service changes are expected to be implemented over a five-year period between December 2024 and 2029.

Future bus service levels under the ongoing Bus Network Redesign Project are evaluated against current service levels to compare existing bus service levels with the anticipated bus service when the proposed Project is in place. Table 1.d.2 presents the existing (Fall 2024) number of trips during peak and daily periods and the planned service as part of the Bus Network Redesign Project.

For this Project area, under the Bus Network Redesign Project, the service levels will remain similar to the existing bus services. With the planned service changes under Bus Network Redesign Project (which has an expected completion date of 2029), the Project Site is anticipated to have about the same level of daily bus service along Concord Avenue and an increase in peak period trips. The changes will result in a slight decrease in daily bus service at the Alewife MBTA Station with the elimination of the Route 350 service, while providing increases in peak period service trips.

Under the Bus Network Redesign Project, no route changes are planned for Route 74 and Route 78. Route 74 will have changes to service frequency and span of service: more late-night Saturday service and Sunday service is introduced. Route 76 is extended to Lexington Center, rerouted inbound to serve Acorn Park Dr., and extended to serve Lincoln Labs/Civil Air Terminal; midday service every 90 minutes is added on weekdays. Similarly, Route 62 is rerouted to serve Acorn Park Dr. going inbound, and service will operate during weekday peak hours approximately every 25 minutes.

Route 350 is removed in the Bus Network Redesign Project, but it is covered in part by Route 80, which connects Burlington, MA to Davis Square via Arlington Center. Route 80 does not connect to Alewife Station, and it is not in the scope of the Project.

Table 1.d.2 MBTA Bus Service: Existing and Planned Trips Near Project Site

Service Route	Direction	Existing Service (2024)			Bus Network Redesign Planned Service (2029)		
		AM Peak Period (7:00–9:00 AM)	PM Peak Period (4:00–6:30 PM)	Daily Trips	AM Peak `Period (7:00–9:00 AM)	PM Peak Period (4:00–6:30 PM)	Daily Trips
Concord Avenue Services							
74 Belmont Circle – Harvard	Inbound	4	5	38	5	7	40

3 Bus Network Redesign: www.mbta.com/projects/bus-network-redesign.

Service Route		Direction	Existing Service (2024) AM Peak Period (7:00–9:00 AM)	Existing Service (2024) PM Peak Period (4:00–6:30 PM)	Existing Service (2024) Daily Trips	Bus Network Redesign Planned Service (2029) AM Peak `Period (7:00–9:00 AM)	Bus Network Redesign Planned Service (2029) PM Peak Period (4:00–6:30 PM)	Bus Network Redesign Planned Service (2029) Daily Trips
	Station	Outbound	4	6	38	5	7	40
78	Arlmont Village – Harvard Station	Inbound	5	5	35	5	5	35
		Outbound	4	5	34	5	5	34
Total Trips Serving the Project Site along Concord Avenue			**17**	**21**	**145**	**20**	**24**	**149**
Services at Alewife Station								
62	Bedford V.A. Hospital – Alewife Station	Inbound	3	4	21	5	7	24
		Outbound	3	4	21	5	7	24
76	Lincoln R&D – Alewife Station	Inbound	3	3	10	4	5	14
		Outbound	3	4	10	4	5	14
67	Turkey Hill – Alewife Station	Inbound	4	5	24	5	6	15
		Outbound	5	5	24	5	6	15
350	North Burlington – Alewife Station	Inbound	6	5	27	0	0	0
		Outbound	5	5	29	0	0	0
Total Trips Serving Alewife Station			**32**	**35**	**166**	**28**	**36**	**106**

Source: Based on MBTA Schedule and Composite Day data, Fall 2024, and MBTA Bus Network Redesign (www.mbta.com/projects/bus-network-redesign/update/bus-network-redesign-approval-and-final-report).

Red Line Transformation Project

The MBTA is advancing major initiatives that will result in more frequent Red Line train service, greater passenger capacity, and better reliability. Under the Red Line Systemwide Improvement Program (aka Red Line Transformation Project)[4] the MBTA has committed to implementing the following through 2027:

- Fleet Replacement
- Maintenance Facility Upgrades
- Capacity and Reliability Improvements (with the goal to be able to operate 3-minute headways), including the Alewife Crossover (a track reconstruction between Alewife and Davis stations)
- Signal Improvements

The fleet replacement continues and will ultimately increase the fleet from 218 vehicles to 252. The elimination of older trains will reduce the occurrence of breakdowns, and thus, passengers should experience greater reliability than what they experience today.

4 Red Line Projects: www.mbta.com/projects/red-line-program.

Private Transit Services

Three Transportation Management Associations ("TMAs")—the Alewife TMA, 128 Business Council, and Middlesex 3 TMA—operate private shuttle services to/from the Alewife MBTA

Station. These non-profit organizations often provide alternative transportation to various commercial areas/business properties for employees/residents of member organizations. The Alewife TMA directly serves the Project Site by providing a shuttle to/from the Quad. The routes of the Alewife TMA are shown in Figure 1.d.2.

Alewife TMA Shuttles

The Alewife TMA provides two shuttle services that connect the Alewife MBTA Station to businesses and residential neighborhoods in the area:

- Alewife Loop: The TMA shuttle serves eleven locations in the Alewife Quad operating approximately every 15 minutes, during peak commuting periods, from approximately 7:00 AM to 10:00 AM and 3:00 PM to 7:00 PM on weekdays.
- The Royal Belmont & CDP: The TMA also operates a shuttle that connects Alewife Station to the Royal Belmont and Cambridge Discovery Park (and Belmont Center upon request), operating every 20 minutes from approximately 6 AM to 9 AM and 4:15 PM to 7:00 PM.

The TMA shuttles provide live GPS location tracking via the *Trakk* App throughout the service duration[5].

Alewife Loop Shuttle

The Alewife Loop shuttles serve twelve members of the TMA located within the Quad (11 stops[6]). The TMA operates a fleet of 14- and 18-passenger shuttles. During the morning schedule, the shuttle operates fully as an on-demand service and tends to pick up riders from residential buildings within the Quad and drops them off at the Alewife Station, where it picks up employees and drops them off at their work in the Quad. During the afternoon schedule, the shuttle drives the full route and makes all stops and tends to picks up riders from Alewife Station and drop them off at their residential buildings within the Quad, where it picks up employees and drops them back off at Alewife Station [7]

Table 1.d.3 presents average and max boardings for the Alewife Loop shuttle as provided by the Alewife TMA.

Table 1.d.3 Alewife Loop: Weekday Ridership Summary (Fall 2024)

Peak Period	Direction	Average Boardings	Max Boardings
AM Peak 7-10 AM	Inbound to Alewife Sta.	17	25
	Outbound to Quad	3	10
PM Peak 3-7 PM	Inbound to Alewife Sta.	4	11
	Outbound to Quad	10	12

[5] Alewife TMA Shuttle Live Tracking - https://www.mytrakk.com/live-tracking?customerToken=bc2df759-0227-436f-af0d-9b526d54e1e4&customerId=60d35ba268f7a00d48198361

[6] TMA stops in the Quad include: 10 Fawcett, 10 Moulton, 10 Wilson, 45 Moulton, 55 Wheeler, 603/605 Concord, 675 Concord, 733 Concord, 75 Moulton, 767C Concord, and 80 Fawcett

[7] Alewife TMA Shuttle Schedule - https://irp.cdn-website.com/ad1d5e33/files/uploaded/Alewife+Shuttle+Schedule+September+2025.pdf

Source: Alewife TMA, TransAction Associates. Data for weekdays in September 2024.

VHB staff conducted observations of the operation of the Alewife Loop shuttle on Tuesday, November 18, 2025 from approximately 8:00 AM to 10:00 AM. Observations included shuttle routing, shuttle fleet, shuttle stop infrastructure and conditions and general rider experiences.

Findings from this limited field study showed that shuttle buses typically maintain their headways of 15-minutes, by relying on short-cuts through parking lots to avoid driving on Concord Ave and the rotary (Alewife Brook Pkwy at Concord Ave). Bus stops are not marked generally, and shuttle buses departing Alewife are not marked or show signage of their destinations. Generally, within the Quad, the shuttle stops were located at the front door of the member building providing door-to-door connection between the Alewife Station and the member building.

128 Business Council

The 128 Business Council has multiple shuttle lines that connect the Alewife MBTA Station to surrounding regions. Five lines provide service between the Alewife MBTA Station and Waltham, two lines provide service to Lexington, and one line connects the Alewife MBTA Station to the Vox on Two Apartments. The shuttles generally run between the peak periods of 6:00 AM to 10:-- AM, and 4:00 PM to 7:00 PM. The 128 Business Council shuttle does not service the project site in the Quad.

Middlesex 3 TMA

The Middlesex 3 TMA provides shuttles from the Haymarket and Alewife MBTA stops to Billerica and Bedford, MA. These shuttles run from the Alewife MBTA Station at 7:00 AM and 8:50 AM and return at 5:30 PM and 7:00 PM and run to Burlington, MA locations at 9:00 AM and 10:30 AM and return at 4:45 PM and 6:15 PM. The Middlesex 3 TMA shuttle does not service the project site in the Quad.

Shared Mobility Services

Bluebikes Bike Share

There are several Bluebikes stations located within the Alewife Quad and the Triangle. Table 1.d.4 lists the stations and their capacity/number of docks, and Figure 1.d.3. illustrates their location on a plan. A comprehensive Bluebikes analysis is provided in Section 13 of this TIS.

Table 1.d.4 Existing Bluebikes Stations

Location	# of Docks
101 Smith Place	23
Smith Place at Wilson Road	19
Concord Ave at Spinelli Place	19
55 Wheeler Street	23
84 Cambridgepark Drive	27
87-101 Cambridgepark Drive	23
Alewife Station at Steel Place	19
Alewife Station at Russell Field	23

Location	# of Docks
Total	**176**

Source: Bluebikes.com accessed as of 12/10/24

Carshare

Three (3) Zipcar vehicles are available at the Alewife MBTA Station,[8] as illustrated in Figure 1.d.3.

1.e Land Use

The Quad has been historically, and is currently primarily, characterized by its industrial and business/office land uses. The surrounding neighborhoods are characterized by their primarily business/office (the Triangle and Fresh Pond Mall areas), open space, and residential uses (both to the east and west – neighborhood west of Blanchard Road) (See Figure 1.e.1).

[8] Zipcar.com accessed as of 12/10/24

2 Data Collection

To perform and submit a traffic assessment, a 2024 Existing Conditions traffic volume network had to be established with the City DOT as an appropriate baseline for a vehicular analysis and serve to evaluate Planning Board Criteria. Turning Movement Counts ("TMCs") at the study area intersections were conducted on Wednesday, October 25, 2023, for most study area intersections. the City DOT generally approved the 2023 counts, with a limited re-count requested for a handful of locations on Tuesday, October 22, 2024. These new count locations included Concord Avenue at Smith Place, Concord Avenue at Fawcett Street, Rindge Avenue at Sherman Street, Garden Street at Walden Street, and Garden Street at Sherman Street / Huron Avenue. Where 2024 counts were conducted, a comparison to 2023 data is included in Section 2.b below, per the TIS scope request.

2.a ATR Counts

48-hour Automatic Traffic Recorder ("ATR") counts were conducted in October 2023, on Concord Avenue, east of Spinelli Place and Alewife Brook Parkway, north of Terminal Road / Fresh Pond Mall Entrance.

Traffic volume summaries for these ATR locations are presented in Tables 2.a.1 and 2.a.2. This data, representing the averages of data collected over two weekdays, illustrates 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 provided in Appendix D.

Table 2.a.1 Existing Traffic Volume Summary (October 2023)

Location	Daily[a]	Morning Peak Hour			Evening Peak Hour		
		Volume[b]	K[c]	Peak Direction	Volume	K	Peak Direction
Concord Avenue, *east of Spinelli Place*	14,252	1,168	8.2%	EB	1,044	7.3%	WB
Alewife Brook Parkway, *north of Terminal Road / Fresh Pond Mall Entrance*	46,433	2,958	6.4%	SB	2,907	6.3%	SB

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 Volume Summary (October 2023)

Start Time	Concord Avenue, *east of Spinelli Place*			Alewife Brook Parkway, *north of Terminal Road / Fresh Pond Mall Entrance*		
	EB	WB	Total	NB	SB	Total
12:00 AM	32	30	62	309	115	424
1:00 AM	13	17	30	127	68	195
2:00 AM	5	5	10	75	45	120
3:00 AM	11	15	26	56	62	118
4:00 AM	23	18	41	83	226	309
5:00 AM	76	64	140	213	1131	1344
6:00 AM	256	146	402	539	1990	2529
7:00 AM	564	335	899	1148	1810	2958
8:00 AM	746	422	1168	1036	1573	2609
9:00 AM	521	377	898	1074	1721	2795
10:00 AM	448	391	839	1066	1601	2667
11:00 AM	465	469	934	1136	1389	2525
12:00 PM	452	521	973	1278	1431	2709
1:00 PM	429	480	909	1301	1355	2656
2:00 PM	439	569	1008	1415	1411	2826
3:00 PM	482	562	1044	1292	1579	2871
4:00 PM	491	538	1029	1260	1647	2907
5:00 PM	458	539	997	1176	1596	2772
6:00 PM	453	497	950	1213	1564	2777
7:00 PM	270	376	646	1362	1207	2569
8:00 PM	228	303	531	1266	804	2070
9:00 PM	121	216	337	864	600	1464
10:00 PM	87	134	221	871	446	1317
11:00 PM	66	92	158	631	271	902
Total	7136	7116	14252	20791	25642	46433

2.b Intersection Turning Movement Counts and Queues

VHB developed peak period TMCs for vehicles at the study area intersections. The results of these counts indicate the overall weekday peak hours for vehicular traffic in the study area are:

- Morning Peak Hour: 7:30 AM – 8:30 AM
- Evening Peak Hour: 4:30 PM – 5:30 PM

As approved by the City DOT, 2024 counts were used as-is, and 2023 counts were adjusted by growing them by 0.5 percent for one year. 2024 Existing Condition vehicular volumes at study area intersections are summarized in Figures 2.b.1 and 2.b.2 for the morning and evening peak hours.

Comparison of 2023 and 2024 TMCs

As noted previously, initial counts were conducted in 2023. However, the City's Scoping Determination requested updated counts be conducted in 2024 at select intersections. As a result, several study area intersections have count data available for both Wednesday, October 25, 2023 and Tuesday, October 22, 2024. These count locations include Concord Avenue at Blanchard Road/Griswold Street, Concord Avenue at Smith Place, Concord Avenue at Fawcett Street, and Concord Avenue at Wheeler Street. Tables 2.b.1 through 2.b.8 compare the 2024 counts to the 2023 counts (as requested in the City's Scoping Determination). Complete data is available in Appendix D.

It should be noted that a signal was installed at the intersection of Concord Avenue at Fawcett Street in the Summer of 2024, which may have influenced changes in traffic counts at this location. In addition, the intersection of Concord Avenue at Wheeler Street saw some changes to access, mainly the City restricting Wheeler Street turns onto Concord Avenue and left turns onto Wheeler Street. It is important to note that despite these turn restrictions being put in place before the 2024 counts were conducted, our count reports did still record between 35 and 75 left-turn movements during the morning and evening peak hours, respectively.

Table 2.b.1 Comparison of 2023 and 2024 TMCs - Concord Ave at Blanchard Rd

Movement	Wednesday, Oct 25, 2023	Tuesday, Oct 22, 2024	Difference
Morning Peak Hour (7:30 AM to 8:30 AM)			
Blanchard Rd NB R	188	169	-19
Blanchard Rd NB T	283	227	-56
Blanchard Rd NB L	3	1	-2
Blanchard Rd SB R	1	6	+5
Blanchard Rd SB T	173	340	+167
Blanchard Rd SB L	216	232	+16
Concord Ave WB R	101	81	-20
Concord Ave WB T	131	158	+27
Concord Ave WB L	135	126	-9
Concord Ave EB R	21	24	+3
Concord Ave EB T	353	285	-68
Concord Ave EB L	27	42	+15
Total	**1,632**	**1,691**	**+59 (+4%)**
Evening Peak Hour (4:30 PM to 5:30 PM)			
Blanchard Rd NB R	152	127	-25
Blanchard Rd NB T	290	253	-37
Blanchard Rd NB L	8	6	-2
Blanchard Rd SB R	8	12	+4
Blanchard Rd SB T	239	253	+14
Blanchard Rd SB L	84	105	+21
Concord Ave WB R	255	222	-33
Concord Ave WB T	232	233	+1
Concord Ave WB L	195	186	-9

Table 2.b.1 Comparison of 2023 and 2024 TMCs - Concord Ave at Blanchard Rd

Movement	Wednesday, Oct 25, 2023	Tuesday, Oct 22, 2024	Difference
Concord Ave EB R	24	19	-5
Concord Ave EB T	235	190	-45
Concord Ave EB L	56	47	-9
Total	**1,778**	**1,653**	**-125 (-7%)**

Table 2.b.2 Comparison of 2023 and 2024 TMCs - Concord Ave at Smith Place

Movement	Wednesday, Oct 25, 2023	Tuesday, Oct 22, 2024	Difference
Morning Peak Hour (7:30 AM to 8:30 AM)			
Smith Pl SB R	44	41	-3
Smith Pl SB L	28	21	-7
Concord Ave WB R	70	72	+2
Concord Ave WB T	359	386	+27
Concord Ave EB T	608	509	-99
Concord Ave EB L	53	59	+6
Total	**1,162**	**1,088**	**-74 (-6%)**
Evening Peak Hour (4:30 PM to 5:30 PM)			
Smith Pl SB R	88	79	-9
Smith Pl SB L	60	55	-5
Concord Ave WB R	15	16	+1
Concord Ave WB T	426	439	+13
Concord Ave EB T	474	437	-37
Concord Ave EB L	27	29	+2
Total	**1,090**	**1,055**	**-35 (-3%)**

Table 2.b.3 Comparison of 2023 and 2024 TMCs - Concord Ave at Fawcett Street

Movement	Wednesday, Oct 25, 2023	Tuesday, Oct 22, 2024	Difference
Morning Peak Hour (7:30 AM to 8:30 AM)			
Fawcett St SB R	30	22	-8
Fawcett St SB L	73	76	+3
Concord Ave WB R	75	56	-19
Concord Ave WB T	455	478	+23
Concord Ave EB T	545	479	-66
Concord Ave EB L	14	17	+3
Total	**1,192**	**1,128**	**+64 (+5%)**
Evening Peak Hour (4:30 PM to 5:30 PM)			
Fawcett St SB R	22	19	-3
Fawcett St SB L	62	95	+33

Table 2.b.3 Comparison of 2023 and 2024 TMCs - Concord Ave at Fawcett Street

Movement	Wednesday, Oct 25, 2023	Tuesday, Oct 22, 2024	Difference
Concord Ave WB R	56	41	-15
Concord Ave WB T	409	421	+12
Concord Ave EB T	551	493	-58
Concord Ave EB L	26	21	-5
Total	**1,126**	**1,090**	**-36 (-3%)**

Table 2.b.4 Comparison of 2023 and 2024 TMCs - Concord Ave at Wheeler Street

Movement	Wednesday, Oct 25, 2023	Tuesday, Oct 22, 2024	Difference
Morning Peak Hour (7:30 AM to 8:30 AM)			
Wheeler St SB R	46	49	+3
Wheeler St SB L	14	13*	-1
Concord Ave WB R	35	39	+4
Concord Ave WB T	481	492	+11
Concord Ave EB T	567	487	-80
Concord Ave EB L	36	22*	-14
Total	**1,179**	**1,103**	**-76 (-6%)**
Evening Peak Hour (4:30 PM to 5:30 PM)			
Wheeler St SB R	90	86	-4
Wheeler St SB L	30	21*	-9
Concord Ave WB R	58	88	+30
Concord Ave WB T	378	367	-11
Concord Ave EB T	504	533	+29
Concord Ave EB L	55	53*	-2
Total	**1,115**	**1,148**	**+33 (+3%)**

Data accounts for peak hour activity from 7:30 AM to 8:30 AM

* Vehicle movement became restricted between 2023 and 2024, however, drivers still make significant illegal left turns

In general, similar volumes are observed between year 2023 and 2024. Concord Avenue at Blanchard Road, saw an increase in vehicles by 4% in the morning and decrease by 7% in the evening. At the intersection of Concord Avenue at Smith Place, the volumes decreased by 6% in the morning and by 3% in the evening. Concord Avenue at Fawcett Street, saw an increase of 5% in the morning and decrease of 3% in the evening. A signal was installed at this intersection of Concord Avenue at Fawcett Street in late summer 2024. At the intersection of Concord Avenue at Wheeler Street, the volumes decreased by 6% in the morning and increased by 3% in the evening. The most notable change in volumes at each intersection is the Concord Avenue eastbound through movement, which is consistently reduced with the exception of Concord Avenue at Wheeler Street in the evening, where it increased slightly.

Queuing Observations

Queue observations at signalized intersections were conducted during peak hour periods. These queue observations are used for the Synchro/SimTraffic model calibration for the queue analysis and are presented below. Queue in field observations were conducted concurrently with the traffic counts on Wednesday, October 25, 2023 and Tuesday, October 22, 2024. Table 2.b.5 summarizes queue observations. A detailed queue analysis is provided in Section 8 of this report.

Table 2.b.5 Signalized Intersection - Queue Observations (# of Cars)

Intersection	Lane Group	Morning Peak Hour	Evening Peak Hour
Concord Avenue at Blanchard Road/ Griswold Street	Concord Avenue EB L/T	5	5
	Concord Avenue EB T/R	4	5
	Concord Avenue WB L	5	9
	Concord Avenue WB T	4	4
	Concord Avenue WB R	4	4
	Blanchard Road NB L/T	6	9
	Blanchard Road NB R	0	0
	Blanchard Road SEB L/T/R	31	20
Concord Avenue at Moulton Street	Concord Avenue EB L/T	3	2
	Concord Avenue EB T/R	3	2
	Concord Avenue WB L/T/R	4	3
	Driveway NB L/T/R	0	0
	Moulton Street SB L/T/R	1	1
Concord Avenue at Fawcett Street	Concord Avenue EB L/T	13	6
	Concord Avenue EB T	18	9
	Concord Avenue WB T/R	3	6
	Fawcett Street SB L/R	3	3
Concord Avenue at Walden Street	Concord Avenue EB L	1	4
	Concord Avenue EB T/R	9	10
	Concord Avenue WB L/T/R	4	6
	Walden Street NB L/T/R	5	7
	Walden Street SB L/T/R	6	12
Concord Avenue at Huron Avenue	Concord Avenue EB L/T/R	6	11
	Concord Avenue WB L/T/R	10	4
	Huron Avenue NB L/T/R	8	8
	Huron Avenue SB L/T/R	9	6
Concord Avenue at Garden	Concord Avenue SEB T	12	5

Table 2.b.5 Signalized Intersection - Queue Observations (# of Cars)

Intersection	Lane Group	Morning Peak Hour	Evening Peak Hour
Street	Garden Street NB L/T	8	6
	Garden Street SB T	5	5
Fresh Pond Parkway at Huron Avenue	Huron Avenue EB L	3	2
	Huron Avenue EB T	30	7
	Huron Avenue EB R	2	1
	Huron Avenue WB L	1	2
	Huron Avenue WB T/R	5	5
	Fresh Pond Parkway NB L/T	15	15
	Fresh Pond Parkway NB T/R	15	15
	Fresh Pond Parkway SB L/T	14	12
	Fresh Pond Parkway SB T/R	14	14
Alewife Brook Parkway at Terminal Road/ Fresh Pond Mall	Terminal Road EB R	2	1
	Fresh Pond Mall Driveway WB R	7	0
	Alewife Brook Parkway NB T	26 +	7
	Alewife Brook Parkway NB R	0	0
	Alewife Brook Parkway SB T	24 +	24 +
	Alewife Brook Parkway SB R	0	1
Alewife Brook Parkway at Rindge Avenue	Rindge Avenue WB L	56 +	56 +
	Rindge Avenue WB R	6	6
	Alewife Brook Parkway NB T/R	3	2
	Alewife Brook Parkway SB T	16	22
Alewife Brook Parkway at Cambridgepark Drive	Cambridgepark Drive EB L	4	4
	Alewife Brook Parkway NB L	6	7
	Alewife Brook Parkway NB T	34	34
	Alewife Brook Parkway SB T	2	4
Alewife Brook Parkway at Concord Turnpike (Route 2)	Route 2 (Signal 16b) EB L	13 +	15 +
	Route 2 (Signal 16d) EB T	3	1
	Alewife Station Exit Ramp (Signal 16c) WB T	14 +	7
	Alewife Station Exit Ramp (Signal 16c) WB R	13 +	12
	Alewife Brook Parkway (Signal 16b) NB T	100 +	100 +
	Alewife Brook Parkway (Signal 16c) NB T	100 +	100 +
	Alewife Brook Parkway (Signal 16b) SB T	2	15
	Alewife Brook Parkway (Signal 16a) SB R	2	15

Table 2.b.5 Signalized Intersection - Queue Observations (# of Cars)

Intersection	Lane Group	Morning Peak Hour	Evening Peak Hour
Massachusetts Avenue at Alewife Brook Parkway	Massachusetts Avenue EB L/T	30	8 +
	Massachusetts Avenue EB T	30	8 +
	Massachusetts Avenue EB R	2	4
	Massachusetts Avenue WB L	50 +	17
	Massachusetts Avenue WB L/T	50 +	17
	Massachusetts Avenue WB T/R	5	2
	Alewife Brook Parkway NB L	3	0
	Alewife Brook Parkway NB T	3	16
	Alewife Brook Parkway NB T/R	2	16
	Alewife Brook Parkway SB L	13	2
	Alewife Brook Parkway SB T	13	26
	Alewife Brook Parkway SB T/R	2	26
Rindge Avenue at Sherman Street	Rindge Avenue EB T/R	1	2
	Rindge Avenue WB L/T	7	8
	Sherman Street NB L/R	1	15
Garden Street at Walden Street	Garden Street EB L/T/R	2	9
	Garden Street WB L/T/R	1	1
	Walden Street NB L/T/R	4	7
	Walden Street SB L/T/R	3	16
Garden Street at Sherman Street at Huron Avenue	Garden Street EB L/T/R	8	1
	Huron Avenue NB L/T/R	6	0
	Huron Avenue SB L/T/R	2	3
	Sherman Street SEB L/T/R	10	3

Based on observations conducted by VHB on Wednesday, October 25, 2023, at most signalized intersections unless otherwise noted

1 Based on observations conducted by VHB on Tuesday, October 29, 2024

Pedestrian and Bicycle Volumes

Traffic counts of pedestrians and bicycles were conducted concurrently with each of the study area TMCs. In addition, 12-hour pedestrian and bicycle counts were conducted at the following locations:

1. Alewife Brook Parkway, between Terminal Road and Rindge Avenue (bridge over the railroad tracks)
2. Concord Avenue mid-block crossing, west of Wheeler Street
3. Concord Avenue at Smith Place

Pedestrian volumes at study area intersections are presented in Figures 2.b.3 and 2.b.4 for the morning and evening peak hours, respectively. Bicycle volumes are presented in Figures 2.b.5 and 2.b.6 for the morning and evening peak hours, respectively. Tables 2.b.6 through 2.b.8 present the 12-hour pedestrian and bicycle counts that were conducted.

A 12-hour TMC was also conducted in support of the signal warrant analysis that was requested in the City's Scoping Determination for the intersection of Concord Avenue at Smith Place. The signal warrant analysis and the collected data are presented in Section 5.c.

Table 2.b.6 12-Hour Pedestrian and Bicycle Volumes – Alewife Brook Parkway, *bridge over the railroad tracks* (October 2023)

	Pedestrian Volumes		Bicycle Volumes	
Start Time	**NB**	**SB**	**NB**	**SB**
7:00 AM	12	30	11	15
8:00 AM	18	37	12	30
9:00 AM	20	20	8	13
10:00 AM	12	16	5	4
11:00 AM	11	23	8	6
12:00 PM	20	24	8	5
1:00 PM	23	23	13	8
2:00 PM	33	18	21	6
3:00 PM	37	25	24	12
4:00 PM	39	37	27	19
5:00 PM	54	55	52	29
6:00 PM	45	30	41	22
Total	**324**	**338**	**230**	**169**

Table 2.b.7 12-Hour Pedestrian and Bicycle Volumes – Concord Avenue, *midblock crossing* (October 2023)

	Pedestrian Volumes		Bicycle Volumes	
Start Time	**NB**	**SB**	**NB**	**SB**
7:00 AM	9	11	8	12
8:00 AM	23	17	12	15
9:00 AM	19	13	7	7
10:00 AM	19	20	3	3
11:00 AM	15	13	5	4
12:00 PM	37	36	12	5
1:00 PM	26	26	7	2
2:00 PM	28	32	6	4
3:00 PM	30	22	18	7
4:00 PM	29	38	12	3
5:00 PM	48	40	55	13
6:00 PM	31	16	26	8
Total	**314**	**284**	**171**	**83**

Table 2.b.8 12-Hour Pedestrian and Bicycle Volumes – Concord Avenue at Smith Place (October 2024)

Start Time	Pedestrian Volumes	Bicycle Volumes
7:00 AM	30	17
8:00 AM	32	24
9:00 AM	26	12
10:00 AM	32	6
11:00 AM	32	5
12:00 PM	40	9
1:00 PM	32	12
2:00 PM	31	12
3:00 PM	72	19
4:00 PM	33	28
5:00 PM	49	37
6:00 PM	28	19
Total	**437**	**200**

2.c Crash Analysis

Study area crash data was obtained from MassDOT's and Cambridge Police Department's ("CPD") records for the most recent three-year period available, January 2018 through December 2021 (excluding 2020) (Table 2.c.1). The summary table includes the calculated crash rates (number of reported crashes per million entering vehicles) based on the evening peak traffic volumes, which excludes 2020 crash data due to the traffic impacts of the Covid-19 pandemic.

A detailed summary by crash type is presented in Appendix I.

Table 2.c.1 MassDOT/CPD Crash Analysis (January 2018 – December 2021, excluding 2020)

Location	Total Crashes (3-year period)	Crashes Involving Pedestrians	Crashes Involving Bicycles	Signalized?	MassDOT District 6 Average Crash Rate	MassDOT Statewide Average Crash Rate	Calculated Crash Rate
Concord Avenue at Blanchard Road/ Griswold Street	13	2	2	Yes	0.71	0.78	0.50
Concord Avenue at Spinelli Place	3	1	1	No	0.52	0.57	0.14
Concord Avenue at Smith Place	8	0	1	No	0.52	0.57	0.39
Concord Avenue at Moulton Street	2	0	0	Yes	0.71	0.78	0.16
Concord Avenue at Fawcett Street	9	1	3	Yes	0.71	0.78	0.53
Concord Avenue at Wheeler Street	6	0	1	No	0.52	0.57	0.29
Concord Avenue at Alewife Brook Parkway/Concord Avenue (rotary)	29	0	2	No	0.52	0.57	0.59
Concord Avenue at Fresh Pond Parkway/ Concord Avenue (rotary)	32	1	1	No	0.52	0.57	0.60
Concord Avenue at Walden Street	7	0	1	Yes	0.71	0.78	0.36
Concord Avenue at Huron Avenue	13	1	1	Yes	0.71	0.78	0.59
Concord Avenue at Garden Street	5	0	0	Yes	0.71	0.78	0.41
Fresh Pond Parkway at Huron Avenue	27	0	0	Yes	0.71	0.78	0.64
Alewife Brook Parkway at Terminal Road/ Fresh Pond Mall	49	1	1	Yes	0.71	0.78	1.03
Alewife Brook Parkway at Rindge Avenue	23	0	0	Yes	0.71	0.78	0.44
Alewife Brook Parkway at Cambridgepark Drive	10	1	1	Yes	0.71	0.78	0.22

Table 2.c.1 MassDOT/CPD Crash Analysis (January 2018 – December 2021, excluding 2020)

Location	Total Crashes (3-year period)	Crashes Involving Pedestrians	Crashes Involving Bicycles	Signalized?	MassDOT District 6 Average Crash Rate	MassDOT Statewide Average Crash Rate	Calculated Crash Rate
Alewife Brook Parkway at Concord Turnpike (Route 2)	35	0	0	Yes	0.71	0.78	0.51
Massachusetts Avenue at Alewife Brook Parkway	32	0	0	Yes	0.71	0.78	0.73
Rindge Avenue at Sherman Street	5	0	1	Yes	0.71	0.78	0.23
Garden Street at Walden Street	7	1	0	Yes	0.71	0.78	0.53
Garden Street at Sherman Street at Huron Avenue	2	0	0	Yes	0.71	0.78	0.18

Source: MassDOT data and CPD data. Crash rate expressed as crashes per million entering vehicles.

Cambridge falls within MassDOT District 6, where the average crash rate for signalized intersections is 0.71 crashes per million entering vehicles and 0.52 crashes per million entering vehicles for unsignalized intersections. Statewide, the average crash rate for signalized intersections is 0.78 crashes per million entering vehicles and 0.57 crashes per million entering vehicles for unsignalized intersections.

The following two signalized intersections exceed the average MassDOT District 6 crash rate of 0.71 crashes per million entering vehicles:

- Alewife Brook Parkway at Terminal Road/Fresh Pond Mall (crash rate = 1.03)
  - This location also exceeds the statewide average crash rate of 0.78.
  - Of the 49 crashes, 14 crashes were angle collisions, 11 crashes were rear-end collisions, and 10 crashes were same-direction sideswipes.
  - The reported crashes may include crashes within the Fresh Pond Mall parking lot. Crashes on the parking lot driveways, which are not recognized as roadways in the MassDOT IMPACT Crash Portal, are shown on the nearest recognized roadway (Alewife Brook Parkway). The data indicates that 18 of the 49 crashes involved a parked motor vehicle, so these crashes may have occurred within the parking lot rather than at the intersection. While these crashes were included to provide a conservative analysis, omitting the 18 crashes would result in an intersection crash rate below the MassDOT District 6 and statewide averages.
- Massachusetts Avenue at Alewife Brook Parkway (crash rate = 0.73)
  - Of the 32 crashes, 11 crashes were same-direction sideswipes, and 10 crashes were angle collisions.

The following two unsignalized intersections exceed both the average MassDOT District 6, as well as statewide crash rates of 0.52 and 0.57 crashes per million entering vehicles, respectively:

- Concord Avenue at Alewife Brook Parkway/Concord Avenue (rotary) (crash rate = 0.59)
  - Of the 28 crashes, 10 crashes were same-direction sideswipes, 7 crashes were angle collisions, and 7 crashes were rear-end collisions.
- Concord Avenue at Fresh Pond Parkway/Concord Avenue (rotary) (crash rate = 0.60)
  - Of the 32 crashes, 14 crashes were same-direction sideswipes, and 11 crashes were angle collisions.

A fatal injury was reported at the intersection of Alewife Brook Parkway at Concord Turnpike (Route 2) in May 2018. There were no reported fatalities at any other study area intersection during the three crash analysis years.

Additionally, the following two intersections are a Highway Safety Improvement Program ("HSIP") Bicycle Crash Cluster location for the years 2012 to 2021:

- Concord Avenue at Garden Street
- Massachusetts Avenue at Alewife Brook Parkway

3 Project Traffic

3.a Mode Share + Vehicle Occupancy Assumptions

Proposed Mode Shares

New Connection - Proposed Bridge over MBTA Commuter Rail Tracks

The Proponent is committed to designing and constructing a bridge (the "Proposed Bridge") over the MBTA commuter rail tracks, providing a long-awaited connection between the Alewife Quad and Triangle areas. The Proposed Bridge currently anticipates accommodating pedestrians and bicycles. The final design of the Proposed Bridge is subject to approval by the MBTA and local agencies with jurisdiction. The Proposed Bridge would shorten travel distance and travel times between the two neighborhoods, as well as between the Alewife MBTA Station and the Project Site. Shorter distance to transit services at the Alewife MBTA Station, including the Red Line, is expected to increase transit share of trips relative to those reflected in baseline/existing mode share data.

The mode shares discussed below in Table 3.a.1 assume that this new connection between the Quad and Triangle areas is in place alongside a future commuter rail station and supports these refined mode shares, which were identified in the City's Scoping Determination.

Table 3.a.1 Proposed Mode Shares

	Drive Alone	Carpool	Transit	Walk	Bike	Micromobility	Telecommute
Residential	31.8%	4.7%	29.2%	8.5%	3.8%	0.5%	21.5%
Technical Office / Office	40.0%	4.4%	17.8%	6.3%	6.3%	0.4%	24.8%
Retail / Neighborhood Use	30.0%	7.2%	28.9%	25.1%	6.4%	0.5%	1.8%

Source:
Per the City DOT, residential mode shares: 2022 and 2023 Parking and Transportation Demand Management Plans ("PTDMs") for sites in the Alewife area include PB254, PB270, PB272, PB279, PB292, and PB255. the City DOT estimates SOV in Quad will become closer to SOV in Alewife Triangle with pedestrian and bicycle bridge and future commuter rail station.
Per the City DOT, office / technical office mode shares: 2022 and 2023 PTDMs for office/technical office sites in the Kendall Square area include F11, F14, F2, F27, F47, F51, F8, PB150, F61, and PB147. Adjustments made by the City DOT based on expected reduction overtime from the average 35.69% telecommute in 2022 and 2023 by 10% (shifted 8% to SOV and 2% to HOV) and rounded up final SOV estimate from 39.13% to 40% to align with City's 40% SOV goal for the Alewife area. the City DOT estimates telecommute will continue to be high into the future. 40% SOV assumes a future bicycle pedestrian bridge, commuter rail station, limited parking spaces, and robust TDM/PTDM.
Per the City DOT, retail/neighborhood uses mode shares: 2022 and 2023 PTDMs for sites with retail employees and patrons in Cambridge include F51, F58/F59, PB294, PB310, F23, F30/PB179, F41, and PB66.

VOR Assumptions

For the retail/neighborhood use trip generation calculation, vehicle occupancy rates ("VORs") were applied. VORs were calculated based on the proposed single occupancy vehicle ("SOV") and high occupancy vehicle ("HOV") mode shares discussed above. The HOV VOR is assumed to be 2.0 persons per vehicles.

3.b Trip Generation Rates

To provide the most accurate trip generation estimates for the Project, each proposed land use (Technical Office, Office, Residential and Retail/Neighborhood Use) was examined individually.

Technical Office / Office

Empirical trip rates based on data presented in PTDM annual reports, as identified by the City DOT in the Scoping Determination, were applied for the technical office and general office land uses. The sample sites selected include technical office land uses, general office land uses and combinations of the two land uses.

The vehicle trip rates were calculated based on the reported entering and exiting driveway counts and occupied land use square footage. The total entering and exiting vehicles were added and then divided by the total square footage to obtain weighted average trip rates. Where applicable, adjustments were made to the driveway counts to account for those employees who drove to work but parked off-site, as well as for the ride hailing (Uber/Lyft) activity occurring off-site. This PTDM research and evaluation concluded with final trip rates (presented in Table 3.b.1) for utilization within the trip generation calculations for the technical office / office land use.

Table 3.b.1 Vehicle Trip Generation Rates – Technical Office/Office (Vehicle trips/KSF)

Daily		Morning Peak Hour		Evening Peak Hour	
Enter	Exit	Enter	Exit	Enter	Exit
1.82	1.82	0.40	0.07	0.07	0.35

Source: 2022 and 2023 PTDMs for several sites, including F1, F6, PB314, F60, F17, PB198, and F66. Adjusted for percent parking off-site and ride hailing trips, per the City DOT.

The resulting Project's estimated vehicle trip generation for the technical office land use (Table 3.b.2) is based on the presented vehicle rates and proposed development program summarized previously in Tables A and B. Trip generation by building for the Technical Office/ Office component is presented in Appendix J.

Table 3.b.2 Vehicle Trip Generation – Technical Office/Office (Vehicle Trips before Credits*)

Daily Trips		Morning Peak Hour		Evening Peak Hour	
Enter	Exit	Enter	Exit	Enter	Exit
4,625	4,625	1,016	178	178	889

*Credits for existing uses to be removed are not accounted for in this calculation; final trip generation will be determined below by applying the trip credit noted in Table 3.c.2.

Retail/Neighborhood Use

For the retail/neighborhood use program on the Site, *Institute of Transportation Engineers* (ITE) Trip Generation Manual land use code (LUC 820) for Shopping Center trip rate was utilized, as documented in the City's Scoping Determination for the Project.

The resulting Project's estimated adjusted vehicle trip generation for the retail/neighborhood use land use (see Table 3.b.3) is based on the proposed development program summarized previously in Tables A and B and adjusted per mode shares in Table 3.a.1. Trip generation by building for the Retail component is presented in Appendix J.

Table 3.b.3 Vehicle Trip Generation – Retail/Neighborhood Use (Vehicle Trips before Credits*)

Daily Trips		Morning Peak Hour		Evening Peak Hour	
Enter	Exit	Enter	Exit	Enter	Exit
489	489	14	8	43	47

Source: *Institute of Transportation Engineers* Trip Generation Manual (11th Edition) – LUC 820. * Credits for existing uses to be removed are not accounted for in this calculation; final trip generation will be determined below by applying the trip credit noted in Table 3.c.2.

Residential

Empirical trip rates based on data presented in TDM annual reports identified by the City DOT in the Scoping Determination were applied for residential land use.

The vehicle trip rates were calculated based on the reported entering and exiting driveway data and number of occupied residential units. The total entering and exiting vehicles were summed and then divided by the total number of residential units to get weighted average trip rates. Where applicable, adjustments were made to the driveway counts to account for those who drove but parked off-site as well, as well as for the ride hailing activity occurring off-site. This TDM research and evaluation concluded with final trip rates (presented in Table 3.b.4) for utilization within the trip generation calculations for the residential land use.

Table 3.b.4 Vehicle Trip Generation Rates – Residential (Vehicle trips/units)

Daily		Morning Peak Hour		Evening Peak Hour	
Enter	Exit	Enter	Exit	Enter	Exit
1.15	1.18	0.04	0.17	0.15	0.09

Source: 2022 and 2023 TDMs for several sites, including PB255, PB254, PB270, and PB272. Adjusted for percent parking off-site and ride hailing trips.

The Project's estimated vehicle trip generation for the residential land use (see Table 3.b.5) is based upon the proposed development program summarized previously in Tables A and B. Trip generation by building for the Residential component is presented in Appendix J.

Table 3.b.5 Vehicle Trip Generation – Residential (Vehicle Trips before Credits*)

Daily Trips		Morning Peak Hour		Evening Peak Hour	
Enter	Exit	Enter	Exit	Enter	Exit
2,640	2,709	92	390	344	207

* Credits for existing uses to be removed are not accounted for in this calculation; final trip generation will be determined below by applying the trip credit noted in Table 3.c.2.

3.c Adjusted Trip Generation

Mode shares and vehicle occupancy rates for the Project were applied to the vehicle trip generation to estimate the AM and PM peak-hour person trips, which include drive-alone and carpool vehicle trips, transit trips, bicycle, walk, micromobility, and telecommute trips. Project-generated person-trips by mode are presented in Table 3.c.1.

Table 3.c.1 Adjusted Trip Generation (before Credits for Existing Use) – by Mode

	Morning Peak Hour			Evening Peak Hour		
Mode	Enter	Exit	Total	Enter	Exit	Total
Drive Alone	1,008	508	1,516	499	1,023	1,522
Carpool	114	69	183	67	120	187
Transit	492	391	883	384	561	945
Walk	176	123	299	138	210	347
Bike	157	68	224	69	157	226
Micromobility	10	7	17	7	11	18
Telecommute	623	330	953	305	621	926
Total	**2,580**	**1,496**	**4,075**	**1,469**	**2,703**	**4,171**

Existing Use

To develop the proposed Project, several existing buildings will be demolished, and accordingly, there will be reductions in vehicle trips within the Quad in associated with the uses at those buildings. To support a balanced traffic analysis, the removal of existing trips will be captured as a "trip credit." The trip credit methodology was coordinated with the City DOT, resulting in the use of ITE LUC 110 Industrial Use trips rates, as well as empirical trip rates for any technical office and general office uses.

The resulting Project's site credit trip generation (Table 3.c.2) is based on the existing program and occupancy rates summarized previously in Table C and adjusted with mode share data.

Table 3.c.2 Existing Site Vehicle Trip Credits (Technical Office/Office (240 KSF) + Industrial (154 KSF))

	Technical Office / Office	Industrial	Total Vehicle Trip Credit
Morning Peak Hour			
In	96	42	**138**
Out	17	6	**23**
Total	**113**	**48**	**161**
Evening Peak Hour			
In	17	3	**20**
Out	84	21	**105**
Total	**101**	**24**	**125**

Source: Per the City DOT, 2022 and 2023 PTDMs for several sites, including F1, F6, PB314, F60, F17, PB198, and F66. Adjusted for percent parking off-site and ride hailing trips. Includes SOV and HOV vehicle trips. Office / technical office mode shares: 2022 and 2023 PTDMs for office/technical office sites in the Kendall Square area, including F11, F14, F2, F27, F47, F51, F8, PB150, F61, and PB147.

Table 3.c.3 shows the estimated net-new vehicles trips, after adjustment for existing land uses that will be removed as part of the Project.

Table 3.c.3 Net-New Vehicle Trips

	Proposed Project	Existing Site (Credit)	Net-New
Morning Peak Hour			
In	1,122	(-138)	984
Out	577	(-23)	554
Total	1,699	(-161)	1,538
Evening Peak Hour			
In	565	(-20)	545
Out	1,143	(-105)	1,038
Total	1,708	(-125)	1,583

Notes: Vehicle trip credits based on Table 3.c.2

3.d Trip Generation by Building

In order to better understand the trip generation for the master plan buildout, the total net-new trip generation presented in Section 3.c is broken down by building and presented in Table 3.d.1

Table 3.d.1 Net-New Vehicle Trips – by Building

Building	Morning Peak Hour			Evening Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
C1	109	19	128	19	96	116
C2	109	19	128	19	96	116
C3	109	19	128	19	96	116
C4	108	20	127	23	99	122
C5	108	19	127	19	96	115
C6	111	20	131	20	99	118
C7	142	26	168	31	130	161
C8	141	26	167	30	130	160
R1	3	33	36	29	14	44
R2	8	75	82	70	36	106
R3	10	69	79	74	44	118
R4	8	62	70	62	35	97
R5	4	41	45	36	18	54
R6	1	10	11	9	4	13
R7	5	59	64	52	25	77
R8	2	36	39	32	15	47
DPW	7	1	8	1	6	7
Total*	**984**	**554**	**1,539**	**546**	**1,039**	**1,585**

* values are rounded

3.e Trip Distribution and Assignment

Vehicle Distribution

Having estimated changes in automobile trips associated with the Project, the next step in the analysis involves the distribution and assignment of these trips to the local roadway network based on geographic distribution of Project vehicular trips. The directional distribution of Project vehicular trips is a function of several variables: the relative locations and densities of population, competing uses, existing travel patterns, and the operational efficiency of the roadways leading to/from the Site.

In estimating the trip distribution patterns of the Project, several metrics were considered by VHB, including those projected by the Alewife Critical Sums Analysis,[9] Streetlight origin-destination data, as well as distribution assumptions made by other area projects. Ultimately, the City DOT approved a methodology for distribution patterns that was based on several sources in combination.

The City-approved distribution assumptions are shown in Table 3.d.1 and presented graphically in Figures 3.d.1 through 3.d.4.

Table 3.d.1 Proposed Trip Distribution Pattern

	Residential		Commercial	
Direction	**Enter**	**Exit**	**Enter**	**Exit**
Route 16 North (Alewife Brook Parkway)	8%	12%	10%	10%
Route 2 West	13%	12%	23%	20%
Route 2 West (not including Access Road)	*7%*	*12%*	*12%*	*20%*
Alewife Station Access Road	*6%*	-	*11%*	-
Blanchard Road North	22%	22%	25%	28%
Blanchard Road South	17%	14%	12%	12%
Concord Ave East	10%	14%	5%	7%
Concord Ave West	12%	9%	9%	10%
Fresh Pond Parkway South	12%	15%	12%	11%
Rindge Ave East	8%	4%	6%	4%

Trip distribution pattern developed in coordination with the City DOT, which considered several sources, including Streetlight origin-destination data, as well as the proposed distribution used for the 735-755 Concord Avenue TIS.
Totals may not equal 100% due to rounded decimals.

9 *Alewife Critical Sums Analysis: Envision Cambridge*. Revised January 25, 2019. Available online at: http://envision.cambridgema.gov/wp-content/uploads/2019/02/Alewife-Critical-Sums-Analysis-Report-w-attachments.pdf

Vehicle Parking + Loading Locations

As presented in Table B, the Project will be supported by up to 4,578 parking spaces located within four (4) free standing parking garages (P1, P2, P3, and P4), and six (6) parking structures located within the following buildings: R1, R2, R3, R4, R5 and R8.

In addition, most buildings will contain their own loading and service area. Loading dock and parking driveway locations for the Quad are highlighted in Figure E.d, while vehicle parking plans are included in Figures G.a through G.ba.

Trip Assignment

When assigning net-new vehicle Project trips to the study area intersections at a more local level (along Concord Avenue), several factors were considered, including: parking locations, the capacities of each of those parking structures, which land uses are assigned to park in each location, and possible driver decision making about accessing each of those locations. For example, it was not always assumed that drivers would take the quickest route to the garage to which they are destined but instead may exit Concord Avenue sooner to avoid potential congestion on the main roadways and navigate to or from garages using the Quad street network. Specifically, drivers approaching the site from the east had many options with similar distances to their desired destination and may choose routes based on perceived quickness, GPS navigation, or other factors. Table 3.d.2 shows these assumptions in route decisions for vehicles driving to and from the site. In addition, the trip assignment took into consideration the possible route of ride hailing, which may not be destined to a parking structure.

Table 3.d.2 Trip Distribution to Site Roadways By Garage Parcel (From the East)

Parking Location	Smith	Moulton	Fawcett	Wheeler
P1/P2	10%	10%	45%	35%
P3	-	-	100%	-
P4	100%	-	-	-
R1/R2	10%	10%	45%	35%
R3	-	-	100%	-
R4	-	100%	-	-
R5	-	100%	-	-
R8	10%	10%	45%	35%

Trip distribution pattern developed in coordination with the City DOT, which considered several sources, including Streetlight origin-destination data, as well as the proposed distribution used for the 735-755 Concord Avenue TIS.

The proposed trip assignment utilized with the Project-generated trips (Table 3.c.3) to determine the Project-generated trips at each of the study area intersections, as illustrated in Figures 3.c.7 through 3.c.8.

3.f Service and Loading

This section provides an overview of the loading and service elements of the proposed Project. Loading for each of the buildings will be provided at-grade and within dedicated loading docks internal to the buildings.

As requested in the Scoping Determination sight line diagrams for each loading dock within the Project are depicted in Appendix K. Figures depicting loading truck turning templates for each loading dock within the Project are also located in Appendix K. During the design review process, the sight lines for each loading dock will be reviewed further and incorporated into the final site plan to ensure that view corridors for truck drivers and pedestrians walking on the sidewalk adjacent to loading docks are maintained for safety. A comprehensive loading dock management plan will also be developed for each building, or set of buildings, as they come online.

Truck Access

As shown in Figure E.d, the loading and service needs of the development will be accommodated within dedicated loading docks, internal to each individual building. Commercial buildings are designed to accommodate a 20-yard dumpster. A compactor could supplement the dumpster or be utilized in lieu of a dumpster and generally be a smaller volume. Residential building facilities will be able to accommodate up to a SU-30 size/type. Table 3.e.1 provides a brief description of the loading access for each building.

Table 3.e.1 Loading Dock Access Location

Building	Loading Dock Access
C1	C1 Mooney Extension, opposite P1
C2	New Mooney
C3	New Mooney
C4	Fawcett Extension, opposite C5
C5	Fawcett Extension, opposite C6
C6	Fawcett Extension, opposite C5
C7	Moulton Street
C8	Fawcett Street
R1	Smith Place
R2	Fawcett Street
R3	Fawcett Street, opposite P3
R4	Moulton Street, opposite R5
R5	Moulton Street, opposite R4
R6	Driveway off Smith Place
R7	Wilson Rd Extension
R8	Fawcett Street
P1	No Loading / Parking Garage
P2	No Loading / Parking Garage
P3	Fawcett Street, opposite R3
P4	No Loading / Parking Garage
E1	Driveway off Concord Ave (Existing to Remain)
E2	No Loading (Existing to Remain)
E3	Driveway off Concord Ave (Existing to Remain)
DPW Yard	Fawcett Extension, opposite C5

Truck Routes

Service and delivery trucks will be directed to access the Site using only designated truck routes as directed by the City of Cambridge. Regionally, trucks will use Route 2 and Alewife Brook Parkway, while avoiding use of Blanchard Road, due to the truck restriction. Locally, trucks will use Fawcett Street, Moulton Street, and Smith Place to access the Site with direct connections from Concord Avenue/Alewife Brook Parkway. Truck routing is shown previously in Figure E.d.

Daily Deliveries

The proposed Project has an estimated truck generation of approximately 650 individual deliveries per day (estimated utilizing the Transportation Research Board's (TRB) *National Cooperative Highway Research Program (NCHRP) Synthesis 298 - Truck Trip Generation Data)*, as summarized in Table 3.e.2. This is a conservative estimate as it assumes that each individual building will generate truck trips, but it is expected that a service or delivery truck will serve multiple buildings with one trip to the Site. These truck trip estimates include a breakdown of smaller vans/trucks, such as parcel delivery and food catering versus larger delivery vehicles (SU-30 size+). The daily parcel delivery vehicles (USPS, UPS, FedEx, etc.) will be encouraged to use the loading docks.

The methodology utilizes the Transportation Research Board's (TRB) *National Cooperative Highway Research Program (NCHRP) Synthesis 298 - Truck Trip Generation Data)*. This publication estimates daily truck trip rates, by vehicle size and by land use. Using this methodology, the full-build out of the Project is expected to attract approximately 650 deliveries per day, including a variety of sizes of cars, vans, and trucks.

Table 3.e.2 shows the estimated daily number of trucks generated by each building, by vehicle size. This methodology is unique to daily delivery activity and is a separate estimate from the trip generation peak hour estimate previously in Section 3a through 3d.

Table 3.e.2 Estimated Daily Number of Generated Truck Trips (one-way)

	NCHRP Method[1]		
Building	**Large Trucks**	**Small Trucks/Vans**	**Total**
Technical Office/Lab	48	29	77
General Office	48	29	77
Residential	22	447	469
Retail/Neighborhood Use	8	20	28
Total	**126**	**525**	**651**

1 Source: NCHRP Synthesis 298 Truck Trip Generation Data: Office 0.037/KSF loading dock deliveries and 0.022/KSF short term deliveries; Residential 0.011/KSF loading dock deliveries and 0.225/KSF short term deliveries; Retail 0.0114/KSF loading dock deliveries and 0.282/KSF short term deliveries (assumed Boston, MA Retail Storefront).

Based on the NCHRP report, the Project will generate approximately 651 daily truck deliveries (126 large trucks and 525 small trucks and vans). It's important to note that the larger share of the truck trips (nearly 80%) are categorized as small trucks/vans and not SU-30 size+ trucks which will represent only about 20% of the trucks trips to the site. Daily truck activity is included in the total daily trip count from previous sections and is expected to generally occur outside of the identified peak hours that the analysis has been conducted for (See Appendix J).

4 Background Traffic

Background Growth

In accordance with the the City DOT Scoping Determination, background traffic reflecting regional growth was assumed to occur at a rate of 0.5% per year, for five (5) years to estimate the 2029 Future Condition traffic volumes.

Background Projects

In addition to the background growth rate, trips associated with other planned projects in the area have been incorporated into the 2029 Future Condition analysis, as directed by the City DOT.

These seven (7) specific projects include:

1. Alewife Park
2. 75-109 Smith Place
3. 40 Smith Place / 45 Wilson Road
4. 605 Concord Avenue (Phase II / 49 units)
5. 55 Wheeler Street
6. 402 Rindge Avenue
7. 735-745 Concord Avenue

An eight project (180 Fawcett Street) was included in City DOT's original scoping determination; however, since it's now part of the proposed development, it has been removed from the background project trip layer.

5 Traffic Analysis

Analysis conditions were developed in accordance with the TIS Guidelines and the City DOT Scoping Determination. The following Exhibit 1 illustrates the different traffic analysis conditions, including 2024 Existing Condition, 2024 Build Condition, 2024 Build-Mitigated Condition, 2029 Future Condition, and 2029 Future-Mitigated Condition, each of which was developed to represent the morning peak hour and the evening peak hour.

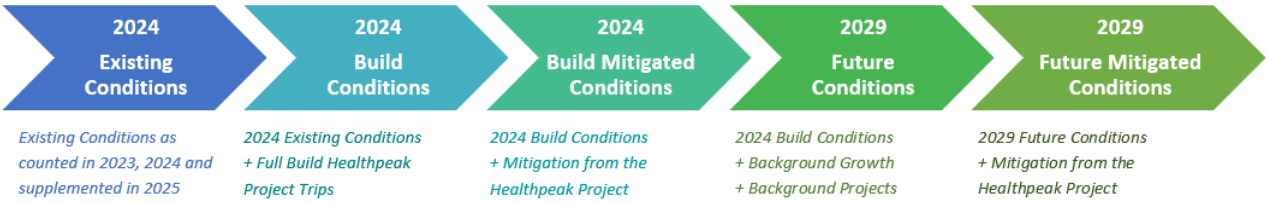

Exhibit 1 - Traffic Analysis Conditions Flowchart

5.a 2024 Existing Condition

The 2024 Existing Condition analysis is based on existing vehicle, bicycle, and pedestrian counts at the study area intersections. Year 2024 counts were used as-is without any adjustments, while 2023 counts were adjusted by 0.5 percent for one year, as requested by the City DOT. The existing model also relied on field inventories collected in 2023, 2024 and supplemented with early 2025 observations. The resulting Existing Condition vehicle networks are shown in Figures 2.b.1 and 2.b.2.

5.b 2024 Build Condition

The 2024 Build Condition assumes full buildout and occupancy of the proposed Project in the year 2024. The resulting 2024 Build traffic volume network consists of the 2024 existing volumes plus the net-new Project-generated vehicle trips, see Figures 5.b.1 and 5.b.2.

5.c 2024 Build-Mitigated Condition

The 2024 Build-Mitigated Condition assumes full buildout and occupancy of the proposed Project, as described in the section above, as well as specific mitigation measures, including:

1. Signalization of Concord Ave at Smith Place

Concord Avenue at Smith Place serves as one of the key access points for the Site and is therefore expected to be impacted by the additional vehicle trips turning into and out of Smith Place. To alleviate impacts to vehicles, pedestrians, and cyclists at this currently stop-controlled intersection, a traffic signal should be considered.

To decide if an intersection should be signalized, a signal warrant evaluation was completed as part of the TIS. The signal warrant analysis was also a specific request in the City's TIS Scoping Determination.

The following section evaluates whether the intersection met traffic signal warrants for potential signalization, and Section 12 presents pedestrian delay changes due to the signalization of this intersection.

Data Collection

To support a signal warrant evaluation, a more detailed data set was obtained. VHB completed a 12-hour Turning Movement Count in October 2024, which is tabulated, along with the other intersection TMCs in Section 2.b, with raw count data sheets provided in Appendix D.

Signal Warrant Evaluation

The Federal Highway Administration's *Manual on Uniform Traffic Control Devices* ("MUTCD") 2009 Edition,[10] specifies nine (9) different conditions which warrant the installation of a signal:

- Warrant 1 – Eight Hour Vehicular Volume
- Warrant 2 – Four Hour Vehicular Volume
- Warrant 3 – Peak Hour
- Warrant 4 – Pedestrian Volume
- Warrant 5 – School Crossing
- Warrant 6 – Coordinated Signal System
- Warrant 7 – Crash Experience
- Warrant 8 – Roadway Network
- Warrant 9 – Intersection Near a Grade Crossing

If an intersection satisfies any or several of these warrants, there is *no requirement to* install a signal; rather one *could be* installed if it improves the overall safety and/or operations of the intersection.

For this TIS, three (3) warrants were found to be appropriate for evaluation for the intersection of Concord Avenue at Smith Place, including Warrant 1, Warrant 2 and Warrant 3, as detailed below:

- Warrant 1 (Eight-Hour Vehicular Volume): Warrant 1 is satisfied if either of the below Condition A or B is met. In addition, Warrant 1 can be satisfied by 80 percent satisfaction of both Condition A and Condition B.
    - *Condition A (Minimum Vehicular Volume): Satisfied when the volume of intersecting traffic (major and minor streets) exceeds MUTCD thresholds for eight or more hours.*
    - *Condition B (Interruption of Continuous Traffic): Satisfied when the volume of major street traffic is so heavy that minor street traffic suffers excessive delay in entering or crossing the major street for eight or more hours.*
- Warrant 2 (Four-Hour Vehicular Volume): Satisfied when volumes (major and minor streets) exceed MUTCD thresholds for four or more hours.
- Warrant 3 (Peak Hour): Satisfied when for the peak hour of a typical day, major and minor street traffic exceeds MUTCD thresholds.

[10] Federal Highway Administration. *Manual on Uniform Traffic Control Devices 2009: for Streets and Highways*. Claitors Publishing, 2010.

Table 5.c.1 summarizes the twelve (12) highest hours of traffic volumes for Concord Avenue at Smith Place and highlights where the combination of volumes meets any of the three volume-based traffic signal warrants. Detailed worksheets are included in Appendix L of the report.

Table 5.c.1 Vehicle Volume-Based Warrants: Concord Ave at Smith Place – Build Condition Volumes

Hour	Entering Volume on Minor Road	Entering Volume on Major Road		Total Entering Volume on Major Road	Meeting volume-based warrants?				
		EB	WB		1A	1B	80%	2	3
7:00-8:00 AM	313	1,010	576	1,586	Yes	Yes	Yes	Yes	Yes
8:00-9:00 AM	269	1,009	629	1,638	Yes	Yes	Yes	Yes	Yes
9:00-10:00 AM	269	996	587	1,583	Yes	Yes	Yes	Yes	Yes
10:00-11:00 AM	265	1,001	591	1,592	Yes	Yes	Yes	Yes	Yes
11:00-12:00 PM	251	994	583	1,577	Yes	Yes	Yes	Yes	Yes
12:00-1:00 PM	258	993	627	1,620	Yes	Yes	Yes	Yes	Yes
1:00-2:00 PM	275	1,005	611	1,617	Yes	Yes	Yes	Yes	Yes
2:00-3:00 PM	253	1,008	623	1,631	Yes	Yes	Yes	Yes	Yes
3:00-4:00 PM	249	996	646	1,642	Yes	Yes	Yes	Yes	Yes
4:00-5:00 PM	250	996	606	1,602	Yes	Yes	Yes	Yes	Yes
5:00-6:00 PM	438	759	690	1,449	Yes	Yes	Yes	Yes	Yes
6:00-7:00 PM	301	1,013	611	1,624	Yes	Yes	Yes	Yes	Yes
				# of Yes	**12**	**12**	**12**	**12**	**12**
				Warrant		**1**		**2**	**3**
				Met?		**Yes**		**Yes**	**Yes**

As shown in Table 5.c.1, the results of the signal warrants evaluation for the intersection of Concord Avenue at Smith Place shows that a signal is warranted.

For the purposes of the vehicle capacity analysis within Section 6, it is assumed that under all mitigated conditions, a new signal *is installed* at the intersection of Concord Avenue at Smith Place. The Project proposes a full signal at this intersection, dedicated left-turn, and right-turn lanes on Smith Place southbound, approaching the interaction with Concord Avenue, are assumed. The Future and Build conditions of the pedestrian level of service analysis in Section 5.c also assumes the installation of the new signal and shows improvements in pedestrian delay.

VHB will work with the City DOT to obtain guidance for further evaluation of the need for a signal at this location.

2. Optimization of Signalized Intersections

As part of the mitigation testing for the Project analysis scenarios, VHB completed an optimization of timings and signal splits/phasing for the signalized locations. The optimization was completed through the Synchro model and carried for all mitigated scenarios.

3. Concord Ave Turn-Lanes

The mitigated conditions assume inclusion of dedicated turn lanes at interactions, specifically Concord Ave at Smith Place and Concord Avenue at Fawcett Street. Turn lanes are assumed in

the westbound (right-turn lane into the Site) and eastbound (left-turn lane into the Site). Refer to Section 7 for a discussion on the Concord Avenue corridor. Refer to Appendix M for 40-scale plans showing roadways and intersections concept plans.

4. Smith Place Turn-Lanes

In addition to proposing a full signal at the intersection of Concord Ave at Smith Place, dedicated left-turn, and right-turn lanes on Smith Place southbound, approaching the interaction with Concord Avenue, are also assumed. Refer to Appendix M for 40-scale plans showing roadways and intersections concept plans.

5. Moulton Street Turn-Lanes

The mitigated condition assumes dedicated left-turn, and right-turn lanes on Moulton Street southbound, approaching the interaction with Concord Avenue. Refer to Appendix M for 40-scale plans showing roadways and intersections concept plans.

6. Fawcett Street Turn-Lanes

The Fawcett Street at Concord Avenue intersection was recently signalized. The mitigation analysis for this Project assumes installation of dedicated left-turn and right-turn lanes on Fawcett Street southbound, approaching the interaction with Concord Avenue. Refer to Appendix M for 40-scale plans showing roadways and intersections concept plans.

The 2024 Build-Mitigated Condition networks and resulting expected traffic volumes are shown in Figures 5.c.1 and 5.c.2.

5.d 2029 Future Condition

The 2029 Future Condition consists of the Project-generated trips, background traffic growth, and expected traffic from planned development projects. Year 2024 traffic volumes are assumed to increase at a rate of 0.5 percent per year for five (5) years, representing background traffic growth. In addition, volumes generated from neighboring projects that are planned to be occupied during this five-year period were added to the traffic network.

The 2029 Future Condition networks and resulting expected future traffic volumes are shown in Figures 5.d.1 and 5.d.2.

5.e 2029 Future-Mitigated Condition

The 2029 Future-Mitigated Condition assumes full buildout and occupancy of the Project, background traffic growth, and expected traffic from planned development projects. 2029 Future traffic volumes and roadway infrastructure mitigation for the Project make up this Future-Mitigated Condition. Similar to Build-Mitigated scenario, the same mitigating strategies are included in this Future-Mitigated scenario (Signalization of Smith Place intersection, optimization of timings, installation of turn lanes along Concord Avenue and alongside streets of Smith Place, Moulton Street and Fawcett Street).

The 2029 Future-Mitigated Condition networks and resulting expected future traffic volumes are shown in Figures 5.e.1 and 5.e.2.

6 Vehicle Capacity Analysis

Synchro 11 traffic analysis software was used to determine the vehicle level of service ("VLOS") for the twenty signalized and unsignalized study area intersections. Synchro software is based on the 2000 Highway Capacity Manual. Because of Synchro's limitations when analyzing rotaries, SIDRA 9.0 software was used for the rotaries at Concord Avenue at Alewife Brook Parkway/Concord Avenue and Concord Avenue at Fresh Pond Parkway/Concord Avenue to determine the VLOS. SIDRA software is based on the 2010 Highway Capacity Manual.

Results for the 2024 Existing, 2024 Build, 2024 Build-Mitigated, 2029 Future, and 2029 Future-Mitigated conditions are presented in Table 6.a.1 and Table 6.a.2 for signalized intersections, Table 6.a.3 and Table 6.a.4 for unsignalized intersections, and Table 6.a.5 and Table 6.a.6 for the rotaries.

The tables also show the difference in delay between the Existing and Build conditions (delay due to Project traffic) and between the Existing and Future delay (total delay from Project and other background growth).

Figures 6.a.1 and 6.a.2 illustrate the overall VLOS for each intersection for the morning and evening peak hour, respectively. Figures 6.a.3 and 6.a.4 illustrate the change in delay. A summary of the analysis results follows.

Table 6.a.1 Signalized Intersection Level of Service (LOS) Analysis Results – Morning Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
Concord Avenue at Blanchard Road / Griswold Street	Concord Avenue EB L/T/R	1.56	326.5	F	1.98	513.2	F	186.7	1.41	258.9	F	-67.6	1.82	440.3	F	113.8	1.53	308.8	F	-17.7
	Concord Avenue WB L	1.11	175.1	F	1.72	420.4	F	245.3	1.72	423.9	F	248.8	1.62	374.8	F	199.7	1.74	430.0	F	254.9
	Concord Avenue WB T	0.37	38	D	0.49	40.0	D	2.0	0.41	35.3	D	-2.7	0.50	40.1	D	2.1	0.45	36.0	D	-2.0
	Concord Avenue WB R	0.22	35.7	D	0.59	43.0	D	7.3	0.49	36.9	D	1.2	0.57	42.2	D	6.5	0.51	37.4	D	1.7
	Blanchard Road NB L/T	1.15	168.5	F	1.15	168.5	F	0.0	1.09	150.2	F	-18.3	1.04	131.7	F	-36.8	1.10	150.5	F	-18.0
	Blanchard Road NB R	0.13	0.2	A	0.23	0.4	A	0.2	0.21	0.3	A	0.1	0.24	0.4	A	0.2	0.24	0.4	A	0.2
	Blanchard Road SEB L/T/R	1.02	83.8	F	1.47	263.5	F	179.7	1.51	282.6	F	198.8	1.49	270.1	F	186.3	1.59	320.2	F	236.4
	OVERALL	**1.17**	**141.4**	**F**	**1.56**	**246.0**	**F**	**104.6**	**1.43**	**200.0**	**F**	**58.6**	**1.50**	**224.2**	**F**	**82.8**	**1.51**	**222.0**	**F**	**80.6**
Concord Ave at Smith Place	Concord Avenue EB L	Unsignalized before mitigation applied.							0.66	22.6	C	n/a	Unsignalized before mitigation applied.				0.91	48.2	D	n/a
	Concord Avenue EB T								0.69	13.1	B	n/a					0.69	13.2	B	n/a
	Concord Avenue WB T								0.97	64.0	E	n/a					0.98	64.8	E	n/a
	Concord Avenue WB R								0.30	25.3	C	n/a					0.34	26.1	C	n/a
	Smith Place SB T								0.71	55.7	E	n/a					0.80	65.8	E	n/a
	Smith Place SB R								0.25	17.0	B	n/a					0.31	17.6	B	n/a
	OVERALL								**0.80**	**31.9**	**C**	**n/a**					**0.87**	**37.6**	**D**	**n/a**
Concord Avenue at Moulton Street	Concord Avenue EB L/T/R	0.36	5.3	A	0.55	11.2	B	114.0	0.49	7.3	A	2.0	0.56	11.9	B	6.6	0.50	7.4	A	2.1
	Concord Avenue WB L/T/R	0.59	8.4	A	0.73	16.9	B	193.0	0.65	7.5	A	-0.9	0.85	23.7	C	15.3	0.75	9.3	A	0.9
	Driveway NB L/T/R	0.27	42.8	D	0.05	32.2	C	5.0	0.10	38.1	D	-4.7	0.05	31.4	C	-11.4	0.10	38.0	D	-4.8
	Moulton Street SB L/T/R	0.44	46.1	D	0.76	51.9	D	82.0	-	-	-	-	0.84	60.6	E	n/a	-	-	-	-
	Moulton Street SB L	-	-	-	-	-	-	-	0.82	78.0	E	n/a	-	-	-	-	0.62	40.4	D	n/a
	Moulton Street SB R	-	-	-	-	-	-	-	0.54	43.8	D	n/a	-	-	-	-	0.27	32.8	C	n/a
	OVERALL	**0.55**	**8.1**	**A**	**0.70**	**17.1**	**B**	**9.0**	**0.64**	**12.5**	**B**	**4.4**	**0.80**	**21.4**	**C**	**13.3**	**0.76**	**11.2**	**B**	**3.1**
Concord Ave at Fawcett Street	Concord Avenue EB L	-	-	-	-	-	-	-	0.81	31.0	C	n/a	-	-	-	-	0.73	27.8	C	n/a
	Concord Avenue EB T	0.36	7.5	A	1.74dl	26.8	C	19.3	0.89	23.9	C	16.4	2.50dl	25.0	C	17.5	0.75	17.0	B	9.5

Table 6.a.1 Signalized Intersection Level of Service (LOS) Analysis Results – Morning Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
	Concord Avenue WB T	0.62	11.8	B	1.09	74.6	E	62.8	0.73	18.4	B	6.6	1.21	122.9	F	111.1	0.75	19.2	B	7.4
	Concord Avenue WB R	-	-	-	-	-	-	-	0.58	14.7	B	n/a	-	-	-	-	0.56	14.4	B	n/a
	Fawcett Street SB L/T/R	0.60	41.8	D	1.27	185.2	F	143.4	-	-	-	-	1.51	288.8	F	n/a	-	-	-	-
	Fawcett Street SB L	-	-	-	-	-	-	-	0.87	57.2	E	n/a	-	-	-	-	0.90	62.2	E	n/a
	Fawcett Street SB R	-	-	-	-	-	-	-	0.37	31.9	C	n/a	-	-	-	-	0.34	31.4	C	n/a
	OVERALL	**0.62**	**12.3**	**B**	**1.28**	**122.5**	**F**	**110.2**	**0.89**	**25.2**	**C**	**12.9**	**1.28**	**112.0**	**F**	**99.7**	**0.79**	**23.7**	**C**	**11.4**
Concord Avenue at Walden Street	Concord Avenue EB L	0.10	14.7	B	0.12	15.0	B	0.3	0.12	15.0	B	0.3	0.14	15.4	B	0.7	0.14	15.4	B	0.7
	Concord Avenue EB T/R	0.68	25.3	C	0.76	28.7	C	3.4	0.76	28.7	C	3.4	0.81	31.9	C	6.6	0.81	31.9	C	6.6
	Concord Avenue WB L/T/R	0.58	22.1	C	0.65	24.0	C	1.9	0.65	24.0	C	1.9	0.72	26.7	C	4.6	0.72	26.7	C	4.6
	Walden Street NEB L/T/R	0.67	40.6	D	0.67	40.6	D	0.0	0.67	40.6	D	0.0	0.92	67.5	E	26.9	0.92	67.5	E	26.9
	Walden Street SWB L/T/R	0.87	52.4	D	0.87	52.4	D	0.0	0.87	52.4	D	0.0	0.91	57.9	E	5.5	0.91	57.9	E	5.5
	OVERALL	**0.75**	**34**	**C**	**0.80**	**34.9**	**C**	**0.9**	**0.80**	**34.9**	**C**	**0.9**	**0.85**	**41.9**	**D**	**7.9**	**0.85**	**41.9**	**D**	**7.9**
Concord Avenue at Huron Avenue	Concord Avenue EB L/T/R	0.74	30.8	C	0.88	42.2	D	11.4	0.88	42.2	D	11.4	0.98	59.5	E	28.7	0.98	59.5	E	28.7
	Concord Avenue WB L/T/R	0.81	33.4	C	0.87	38.2	D	4.8	0.87	38.2	D	4.8	0.93	46.5	D	13.1	0.93	46.5	D	13.1
	Huron Avenue NB L/T/R	1.13	117.1	F	1.19	141.4	F	24.3	1.19	141.4	F	24.3	1.26	169.0	F	51.9	1.26	169.0	F	51.9
	Huron Avenue SB L/T/R	0.78	41.9	D	0.78	41.9	D	0.0	0.78	41.9	D	0.0	0.82	45.1	D	3.2	0.82	45.1	D	3.2
	OVERALL	**0.94**	**55.1**	**E**	**1.01**	**64.3**	**E**	**9.2**	**1.01**	**64.3**	**E**	**9.2**	**1.10**	**77.8**	**E**	**22.7**	**1.10**	**77.8**	**E**	**22.7**
Concord Avenue at Garden Street	Garden Street NB L	0.81	39.6	D	0.88	46.3	D	6.7	0.88	46.3	D	6.7	0.95	57.7	E	18.1	0.95	57.7	E	18.1
	Garden Street SB T	0.53	25.7	C	0.53	25.7	C	0.0	0.53	25.7	C	0.0	0.58	27.2	C	1.5	0.58	27.2	C	1.5
	Concord Avenue SEB R	0.44	25.4	C	0.48	26.4	C	1.0	0.48	26.4	C	1.0	0.50	27.0	C	1.6	0.50	27.0	C	1.6
	OVERALL	**0.64**	**30.5**	**C**	**0.67**	**33.4**	**C**	**2.9**	**0.67**	**33.4**	**C**	**2.9**	**0.73**	**38.3**	**D**	**7.8**	**0.73**	**38.3**	**D**	**7.8**
Fresh Pond Parkway at Huron Avenue	Huron Avenue EB L	0.57	48.4	D	0.61	50.6	D	2.2	0.61	50.6	D	2.2	0.64	53.0	D	4.6	0.64	53.0	D	4.6
	Huron Avenue EB T	1.54	306.9	F	1.54	306.9	F	0.0	1.54	306.9	F	0.0	1.58	322.3	F	15.4	1.58	322.3	F	15.4
	Huron Avenue EB R	0.18	39.1	D	0.18	39.4	D	0.3	0.18	39.4	D	0.3	0.19	39.5	D	0.4	0.19	39.5	D	0.4
	Huron Avenue WB L	0.06	52.7	D	0.06	52.7	D	0.0	0.06	52.7	D	0.0	0.06	52.7	D	0.0	0.06	52.7	D	0.0

Table 6.a.1 Signalized Intersection Level of Service (LOS) Analysis Results – Morning Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
	Huron Avenue WB T/R	0.51	36.3	D	0.51	36.3	D	0.0	0.51	36.3	D	0.0	0.52	36.5	D	0.2	0.52	36.5	D	0.2
	Fresh Pond Parkway NB L/T/R	0.74	35	D	0.77	36.1	D	1.1	0.77	36.1	D	1.1	0.78	36.6	D	1.6	0.78	36.6	D	1.6
	Fresh Pond Parkway SB L/T/R	0.93	49.8	D	0.99	61.4	E	11.6	0.99	61.4	E	11.6	1.09	92.9	F	43.1	1.09	92.9	F	43.1
	OVERALL	**0.85**	**90.2**	**F**	**0.88**	**93.5**	**F**	**3.3**	**0.88**	**93.5**	**F**	**3.3**	**0.94**	**108.3**	**F**	**18.1**	**0.94**	**108.3**	**F**	**18.1**
Alewife Brook Parkway at Terminal Road / Fresh Pond Mall	Terminal Road EB R	0.02	51.5	D	0.08	51.5	D	0.0	0.08	51.5	D	0.0	0.10	51.1	D	-0.4	0.10	51.1	D	-0.4
	Fresh Pond Driveway WB R	0.34	54.7	D	0.44	55.5	E	0.8	0.44	55.5	E	0.8	0.50	55.9	E	1.2	0.50	55.9	E	1.2
	Alewife Brook Parkway NB T	0.84	10.8	B	0.97	26.5	C	15.7	0.97	26.5	C	15.7	1.06	52.2	D	41.4	1.06	52.2	D	41.4
	Alewife Brook Parkway NB R	0.05	2.1	A	0.05	2.4	A	0.3	0.05	2.4	A	0.3	0.05	2.6	A	0.5	0.05	2.6	A	0.5
	Alewife Brook Parkway SB T	0.9	14.7	B	1.15	86.5	F	71.8	1.15	86.5	F	71.8	1.21	114.9	F	100.2	1.21	114.9	F	100.2
	Alewife Brook Parkway SB R	0.2	2.5	A	0.21	2.8	A	0.3	0.21	2.8	A	0.3	0.21	3.1	A	0.6	0.21	3.1	A	0.6
	OVERALL	**0.83**	**13.7**	**B**	**1.06**	**55.1**	**E**	**41.4**	**1.06**	**55.1**	**E**	**41.4**	**1.12**	**79.0**	**E**	**65.3**	**1.12**	**79.0**	**E**	**65.3**
Alewife Brook Parkway at Rindge Avenue	Rindge Avenue WB L	0.84	86.8	F	1.17	174.1	F	87.3	1.17	174.1	F	87.3	1.23	194.4	F	107.6	1.23	194.4	F	107.6
	Rindge Avenue WB R	0.48	60.1	E	0.49	60.5	E	0.4	0.49	60.5	E	0.4	0.62	67.4	E	7.3	0.62	67.4	E	7.3
	Alewife Brook Parkway NB T/R	1.2	137.1	F	1.35	203.7	F	66.6	1.35	203.7	F	66.6	1.47	256.9	F	119.8	1.47	256.9	F	119.8
	Alewife Brook Parkway SB T	0.93	19.9	B	1.12	72.4	E	52.5	1.12	72.4	E	52.5	1.17	94.9	F	75.0	1.17	94.9	F	75.0
	OVERALL	**0.88**	**71.9**	**E**	**1.05**	**124.1**	**F**	**52.2**	**1.05**	**124.1**	**F**	**52.2**	**1.12**	**157.1**	**F**	**85.2**	**1.12**	**157.1**	**F**	**85.2**
Alewife Brook Parkway at Cambridgepark Drive	Cambridgepark Drive EB L	0.13	30	C	0.13	30.0	C	0.0	0.13	30.0	C	0.0	0.13	30.0	C	0.0	0.13	30.0	C	0.0
	Cambridgepark Drive EB R	1.01	94.1	F	1.37	226.8	F	132.7	1.37	226.8	F	132.7	1.44	256.0	F	161.9	1.44	256.0	F	161.9
	Alewife Brook Parkway NB L	0.72	41.5	D	0.72	40.8	D	-0.7	0.72	40.8	D	-0.7	0.82	43.0	D	1.5	0.82	43.0	D	1.5
	Alewife Brook Parkway NB T	0.87	10.3	B	0.96	13.1	B	2.8	0.96	13.1	B	2.8	1.01	22.5	C	12.2	1.01	22.5	C	12.2
	Alewife Brook Parkway SB T	0.93	45	D	1.12	96.4	F	51.4	1.12	96.4	F	51.4	1.17	118.8	F	73.8	1.17	118.8	F	73.8
	Alewife Brook Parkway SB R	0.09	15.7	B	0.11	13.9	B	-1.8	0.11	13.9	B	-1.8	0.12	13.9	B	-1.8	0.12	13.9	B	-1.8
	OVERALL	**1.03**	**35.6**	**D**	**1.28**	**75.9**	**E**	**40.3**	**1.28**	**75.9**	**E**	**40.3**	**1.34**	**91.2**	**F**	**55.6**	**1.34**	**91.2**	**F**	**55.6**
Alewife Brook	Route 2 (Signal 10b) EB L	0.82	61	E	0.82	61.0	E	0.0	0.82	61.0	E	0.0	0.86	65.1	E	4.1	0.86	65.1	E	4.1

Table 6.a.1 Signalized Intersection Level of Service (LOS) Analysis Results – Morning Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
Parkway at Route 2/16	Route 2 (Signal 10d) EB R	0.43	13.5	B	0.49	14.4	B	0.9	0.49	14.0	B	0.5	0.51	14.7	B	1.2	0.51	14.7	B	1.2
	Alewife Brook Parkway (Signal 10b) SB T	0.4	40.9	D	0.51	43.1	D	2.2	0.51	43.0	D	2.1	0.53	43.5	D	2.6	0.53	43.5	D	2.6
	Alewife Brook Parkway (Signal 10b) NB L	1.2	121.1	F	1.27	153.9	F	32.8	1.27	154.0	F	32.9	1.32	179.6	F	58.5	1.32	179.6	F	58.5
	Alewife Station Exit Ramp (Signal 10c) WB T	0.23	11.6	B	0.23	11.6	B	0.0	0.23	12.0	B	0.4	0.28	12.1	B	0.5	0.28	12.1	B	0.5
	Alewife Station Exit Ramp (Signal 10c) WB R	0.16	10.8	B	0.16	10.8	B	0.0	0.16	11.0	B	0.2	0.16	10.9	B	0.1	0.16	10.9	B	0.1
	Alewife Brook Parkway (Signal 10c) NB T	0.19	22.4	C	0.28	22.1	C	-0.3	0.28	22.0	C	-0.4	0.32	22.0	C	-0.4	0.32	22.0	C	-0.4
	Alewife Brook Parkway (Signal 10a) SB R	0.89	37.5	D	0.89	37.5	D	0.0	0.89	37.5	D	0.0	0.91	40.0	D	2.5	0.91	40.0	D	2.5
	OVERALL		**58.8**	**E**		**68.0**	**E**	**9.3**		**68.0**	**E**	**9.3**		**76.4**	**E**	**17.6**		**76.4**	**E**	**17.6**
Massachusetts Avenue at Alewife Brook Parkway	Massachusetts Avenue EB L/T	1.16	150.2	F	1.16	150.2	F	0.0	1.16	150.2	F	0.0	1.19	160.1	F	9.9	1.19	160.1	F	9.9
	Massachusetts Avenue EB R	0.61	59.7	E	0.66	62.3	E	2.6	0.66	62.3	E	2.6	0.70	64.9	E	5.2	0.70	64.9	E	5.2
	Massachusetts Avenue WB L	1.03	135.5	F	1.12	163.5	F	28.0	1.12	163.5	F	28.0	1.14	171.2	F	35.7	1.14	171.2	F	35.7
	Massachusetts Avenue WB L/T/R	0.95	99.8	F	1.00	112.1	F	12.3	1.00	112.1	F	12.3	1.02	117.2	F	17.4	1.02	117.2	F	17.4
	Alewife Brook Parkway NB L	0.47	70.6	E	0.50	72.5	E	1.9	0.50	72.5	E	1.9	0.53	73.7	E	3.1	0.53	73.7	E	3.1
	Alewife Brook Parkway NB T/R	0.76	55.1	E	0.84	59.6	E	4.5	0.84	59.6	E	4.5	0.88	63.4	E	8.3	0.88	63.4	E	8.3
	Alewife Brook Parkway SB L	0.49	71.7	E	0.53	73.7	E	2.0	0.53	73.7	E	2.0	0.54	74.5	E	2.8	0.54	74.5	E	2.8
	Alewife Brook Parkway SB T	2.34	663.2	F	2.49	727.2	F	64.0	2.49	727.2	F	64.0	2.63	790.1	F	126.9	2.63	790.1	F	126.9
	Alewife Brook Parkway SB R	0.09	40.1	D	0.09	40.1	D	0.0	0.09	40.1	D	0.0	0.09	40.1	D	0.0	0.09	40.1	D	0.0
	OVERALL	**1.17**	**291.8**	**F**	**1.23**	**317.7**	**F**	**25.9**	**1.23**	**317.7**	**F**	**25.9**	**1.28**	**345.9**	**F**	**54.1**	**1.28**	**345.9**	**F**	**54.1**
Rindge Avenue at Sherman Street	Rindge Avenue EB T/R	0.19	7.3	A	0.20	7.4	A	0.1	0.20	7.4	A	0.1	0.23	7.6	A	0.3	0.23	7.6	A	0.3
	Rindge Avenue WB L/T	0.77	18.6	B	0.84	23.0	C	4.4	0.84	23.0	C	4.4	0.90	28.5	C	9.9	0.90	28.5	C	9.9
	Sherman Street NB L/R	0.7	60.9	E	0.70	60.9	E	0.0	0.70	60.9	E	0.0	0.80	70.7	E	9.8	0.80	70.7	E	9.8
	OVERALL	**0.71**	**22.6**	**C**	**0.77**	**25.0**	**C**	**2.4**	**0.77**	**25.0**	**C**	**2.4**	**0.83**	**30.2**	**C**	**7.6**	**0.83**	**30.2**	**C**	**7.6**
Garden Street at Walden Street	Garden Street EB L/T/R	0.59	25.1	C	0.59	25.1	C	0.0	0.59	25.1	C	0.0	0.61	25.6	C	0.5	0.61	25.6	C	0.5
	Garden Street WB L/T/R	0.18	17.3	B	0.18	17.3	B	0.0	0.18	17.3	B	0.0	0.19	17.3	B	0.0	0.19	17.3	B	0.0

Table 6.a.1 Signalized Intersection Level of Service (LOS) Analysis Results – Morning Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
	Walden Street NB L/T/R	0.31	19.3	B	0.32	19.4	B	0.1	0.32	19.4	B	0.1	0.32	19.5	B	0.2	0.32	19.5	B	0.2
	Walden Street SB L/T/R	0.96	53.7	D	0.96	53.7	D	0.0	0.96	53.7	D	0.0	0.98	58.4	E	4.7	0.98	58.4	E	4.7
	OVERALL	**0.77**	**37.6**	**D**	**0.77**	**37.5**	**D**	**-0.1**	**0.77**	**37.5**	**D**	**-0.1**	**0.79**	**40.0**	**D**	**2.4**	**0.79**	**40.0**	**D**	**2.4**
Garden Street at Sherman Street/ Huron Avenue	Garden Street EB L/T/R	0.99	113.1	F	0.99	113.2	F	0.1	0.99	113.2	F	0.1	1.02	123.5	F	10.4	1.02	123.5	F	10.4
	Sherman Street SB L/T/R	0.89	73.3	E	0.89	73.3	E	0.0	0.89	73.3	E	0.0	0.90	73.7	E	0.4	0.90	73.7	E	0.4
	Huron Street NE L/T/R	0.41	29.9	C	0.41	30.0	C	0.1	0.41	30.0	C	0.1	0.43	30.5	C	0.6	0.43	30.5	C	0.6
	Huron Street SW L/T/R	0.9	74	E	0.90	74.5	E	0.5	0.90	74.5	E	0.5	0.92	80.0	E	6.0	0.92	80.0	E	6.0
	OVERALL	**0.73**	**72.2**	**E**	**0.73**	**72.2**	**E**	**0.0**	**0.73**	**72.2**	**E**	**0.0**	**0.75**	**76.0**	**E**	**3.8**	**0.75**	**76.0**	**E**	**3.8**

v/c = volume-to-capacity ratio (a value of 1.0 denotes at capacity)

Delay = average delay per vehicle, expressed in seconds

VLOS = vehicular level of service

Table 6.a.2 Signalized Intersection Level of Service (LOS) Analysis Results – Evening Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
Concord Avenue at Blanchard Road / Griswold Street	Concord Avenue EB L/T/R	0.83	60.1	E	1.07	124.9	F	64.8	1.10	141.4	F	**81.3**	1.19	170.4	F	**110.3**	1.20	175.8	F	115.7
	Concord Avenue WB L	1.18	179.2	F	2.25	644.5	F	465.3	1.25	197.8	F	**18.6**	2.52	765.7	F	**586.5**	1.35	239.4	F	60.2
	Concord Avenue WB T	0.42	27.5	C	0.66	40.3	D	12.8	0.55	32.4	C	**4.9**	0.75	46.5	D	**19.0**	0.60	34.0	C	6.5
	Concord Avenue WB R	0.48	28.6	C	1.23	168.2	F	139.6	1.02	86.6	F	**58.0**	1.34	212.8	F	**184.2**	1.07	103.0	F	74.4
	Blanchard Road NB L/T	1.04	113.1	F	1.09	139.6	F	26.5	1.17	172.4	F	**59.3**	1.15	163.6	F	**50.5**	1.20	187.0	F	73.9
	Blanchard Road NB R	0.09	0.1	A	0.15	0.2	A	0.1	0.15	0.2	A	**0.1**	0.16	0.2	A	**0.1**	0.16	0.2	A	0.1
	Blanchard Road SEB L/T/R	0.85	54.8	D	0.92	61.4	E	6.6	1.08	115.1	F	**60.3**	0.94	65.5	E	**10.7**	1.17	147.7	F	92.9
	OVERALL	**0.93**	**67.6**	**E**	**1.24**	**174.7**	**F**	**107.1**	**1.14**	**108.1**	**F**	**40.5**	**1.29**	**203.4**	**F**	**135.8**	**1.22**	**129.5**	**F**	**61.9**
Concord Ave at Smith Place	Concord Avenue EB L	Unsignalized before mitigation applied.							0.72	29.1	C	**n/a**	Unsignalized before mitigation applied.				0.84	40.7	D	**n/a**
	Concord Avenue EB T								0.68	19.1	B	**n/a**					0.73	20.8	C	**n/a**
	Concord Avenue WB T								0.93	48.4	D	**n/a**					0.92	46.1	D	**n/a**
	Concord Avenue WB R								0.16	18.6	B	**n/a**					0.18	19.0	B	**n/a**
	Smith Place SB T								0.45	35.7	D	**n/a**					0.53	37.1	D	**n/a**
	Smith Place SB R								0.77	35.7	D	**n/a**					0.98	65.7	E	**n/a**
	OVERALL								**0.84**	**33.6**	**C**	**n/a**					**0.92**	**40.6**	**D**	**n/a**
Concord Avenue at Moulton Street	Concord Avenue EB L/T/R	0.32	8.2	A	0.65	19.2	B	11.0	0.53	12.3	B	**4.1**	0.93	42.0	D	**33.8**	0.65	17.4	B	**9.2**
	Concord Avenue WB L/T/R	0.47	10.3	B	0.96	46.3	D	36.0	0.82	22.5	C	**12.2**	1.20	130.6	F	**120.3**	0.93	25.4	C	**15.1**
	Driveway NB L/T/R	0.25	34.6	C	0.09	24.4	C	-10.2	0.14	30.6	C	**-4.0**	0.07	18.7	B	**-15.9**	0.53	50.0	D	**15.4**
	Moulton Street SB L/T/R	0.69	47.7	D	0.71	36.3	D	-11.4	-	-	-	**-**	0.69	29.1	C	**n/a**	-	-	-	**-**
	Moulton Street SB L	-	-	-	-	-	-	-	0.75	47.6	D	**n/a**	-	-	-	**-**	0.81	42.5	D	**n/a**
	Moulton Street SB R	-	-	-	-	-	-	-	0.25	31.5	C	**n/a**	-	-	-	**-**	0.14	21.3	C	**n/a**
	OVERALL	**0.49**	**14.1**	**B**	**0.83**	**33.0**	**C**	**18.9**	**0.76**	**21.0**	**C**	**6.9**	**0.91**	**74.8**	**E**	**60.7**	**0.93**	**24.3**	**C**	**10.2**
Concord Ave at Fawcett Street	Concord Avenue EB L	-	-	-	-	-	-	-	0.45	20.9	C	**n/a**	-	-	-	**-**	0.75	29.1	C	**n/a**
	Concord Avenue EB T	0.32	8.2	A	0.63	13.0	B	4.8	0.98	50.3	D	**42.1**	0.87	22.7	C	**14.5**	1.11	80.3	F	**72.1**

Table 6.a.2 Signalized Intersection Level of Service (LOS) Analysis Results – Evening Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
	Concord Avenue WB T	0.47	10.3	B	0.75	17.1	B	6.8	0.76	28.2	C	**17.9**	0.80	19.3	B	**9.0**	0.74	25.9	C	**15.6**
	Concord Avenue WB R	-	-	-	-	-	-	-	0.28	16.9	B	**n/a**	-	-	-	**-**	0.33	16.5	B	**n/a**
	Fawcett Street SB L/T/R	0.25	34.6	C	2.72	825.0	F	790.4	-	-	-	**-**	3.02	957.5	F	**n/a**	-	-	-	**-**
	Fawcett Street SB L	-	-	-	-	-	-	-	0.93	52.1	D	**n/a**	-	-	-	**-**	1.12	108.4	F	**n/a**
	Fawcett Street SB R	-	-	-	-	-	-	-	0.40	23.2	C	**n/a**	-	-	-	**-**	0.44	24.8	C	**n/a**
	OVERALL	**0.49**	**14.1**	**B**	**1.16**	**258.7**	**F**	**244.6**	**0.96**	**39.0**	**D**	**24.9**	**1.32**	**293.7**	**F**	**279.6**	**1.11**	**61.3**	**E**	**47.2**
Concord Avenue at Walden Street	Concord Avenue EB L	0.39	20	C	0.43	21.2	C	1.2	0.43	21.2	C	1.2	0.48	22.9	C	2.9	0.48	22.9	C	2.9
	Concord Avenue EB T/R	0.75	27.7	C	0.87	36.7	D	9.0	0.87	36.7	D	9.0	0.95	46.9	D	19.2	0.95	46.9	D	19.2
	Concord Avenue WB L/T/R	0.72	27	C	0.80	31.5	C	4.5	0.80	31.5	C	4.5	0.95	49.9	D	22.9	0.95	49.9	D	22.9
	Walden Street NEB L/T/R	0.64	37.6	D	0.64	37.6	D	0.0	0.64	37.6	D	0.0	0.78	45.8	D	8.2	0.78	45.8	D	8.2
	Walden Street SWB L/T/R	0.68	39.2	D	0.68	39.2	D	0.0	0.68	39.2	D	0.0	0.71	40.5	D	1.3	0.71	40.5	D	1.3
	OVERALL	**0.72**	**30.8**	**C**	**0.80**	**34.8**	**C**	**4.0**	**0.80**	**34.8**	**C**	**4.0**	**0.88**	**44.9**	**D**	**14.1**	**0.88**	**44.9**	**D**	**14.1**
Concord Avenue at Huron Avenue	Concord Avenue EB L/T/R	0.9	46	D	1.08	90.2	F	44.2	1.08	90.2	F	44.2	1.19	131.6	F	85.6	1.19	131.6	F	85.6
	Concord Avenue WB L/T/R	0.92	44.7	D	0.97	55.0	D	10.3	0.97	55.0	D	10.3	1.03	70.1	E	25.4	1.03	70.1	E	25.4
	Huron Avenue NB L/T/R	0.65	34.6	C	0.68	36.2	D	1.6	0.68	36.2	D	1.6	0.72	38.6	D	4.0	0.72	38.6	D	4.0
	Huron Avenue SB L/T/R	0.88	50.6	D	0.88	50.6	D	0.0	0.88	50.6	D	0.0	0.92	55.9	E	5.3	0.92	55.9	E	5.3
	OVERALL	**0.9**	**44.9**	**D**	**1.00**	**61.7**	**E**	**16.8**	**1.00**	**61.7**	**E**	**16.8**	**1.08**	**81.3**	**F**	**36.4**	**1.08**	**81.3**	**F**	**36.4**
Concord Avenue at Garden Street	Garden Street NB L	0.85	42	D	0.90	48.4	D	6.4	0.90	48.4	D	6.4	0.96	58.3	E	16.3	0.96	58.3	E	16.3
	Garden Street SB T	0.47	27.2	C	0.47	27.2	C	0.0	0.47	27.2	C	0.0	0.56	29.5	C	2.3	0.56	29.5	C	2.3
	Concord Avenue SEB R	0.38	24	C	0.45	25.5	C	1.5	0.45	25.5	C	1.5	0.49	26.5	C	2.5	0.49	26.5	C	2.5
	OVERALL	**0.6**	**32.2**	**C**	**0.63**	**35.0**	**D**	**2.8**	**0.63**	**35.0**	**D**	**2.8**	**0.69**	**39.9**	**D**	**7.7**	**0.69**	**39.9**	**D**	**7.7**
Fresh Pond Parkway at Huron Avenue	Huron Avenue EB L	0.78	79	E	0.85	93.5	F	14.5	0.85	93.5	F	14.5	0.94	123.9	F	44.9	0.94	123.9	F	44.9
	Huron Avenue EB T	1.38	237.1	F	1.38	237.1	F	0.0	1.38	237.1	F	0.0	1.41	251.6	F	14.5	1.41	251.6	F	14.5
	Huron Avenue EB R	0.09	38.3	D	0.09	38.4	D	0.1	0.09	38.4	D	0.1	0.09	38.4	D	0.1	0.09	38.4	D	0.1

Table 6.a.2 Signalized Intersection Level of Service (LOS) Analysis Results – Evening Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
	Huron Avenue WB L	0.11	53.1	D	0.11	53.1	D	0.0	0.11	53.1	D	0.0	0.11	53.1	D	0.0	0.11	53.1	D	0.0
	Huron Avenue WB T/R	0.69	42.4	D	0.69	42.4	D	0.0	0.69	42.4	D	0.0	0.71	43.2	D	0.8	0.71	43.2	D	0.8
	Fresh Pond Parkway NB L/T/R	0.74	35.2	D	0.79	37.4	D	2.2	0.79	37.4	D	2.2	0.90	47.3	D	12.1	0.90	47.3	D	12.1
	Fresh Pond Parkway SB L/T/R	1.07	85.6	F	1.14	112.5	F	26.9	1.14	112.5	F	26.9	1.25	157.0	F	71.4	1.25	157.0	F	71.4
	OVERALL	**0.89**	**90.3**	**F**	**0.92**	**101.9**	**F**	**11.6**	**0.92**	**101.9**	**F**	**11.6**	**0.98**	**126.6**	**F**	**36.3**	**0.98**	**126.6**	**F**	**36.3**
Alewife Brook Parkway at Terminal Road / Fresh Pond Mall	Terminal Road EB R	0.25	45.4	D	0.27	47.6	D	2.2	0.27	47.6	D	2.2	0.28	47.6	D	2.2	0.28	47.6	D	2.2
	Fresh Pond Driveway WB R	0.7	56.8	E	0.81	67.8	E	11.0	0.81	67.8	E	11.0	0.83	70.8	E	14.0	0.83	70.8	E	14.0
	Alewife Brook Parkway NB T	0.51	8.9	A	0.68	12.6	B	3.7	0.68	12.6	B	3.7	0.73	14.0	B	5.1	0.73	14.0	B	5.1
	Alewife Brook Parkway NB R	0.09	6	A	0.10	6.5	A	0.5	0.10	6.5	A	0.5	0.10	6.7	A	0.7	0.10	6.7	A	0.7
	Alewife Brook Parkway SB T	0.68	11.7	B	0.77	15.1	B	3.4	0.77	15.1	B	3.4	0.83	17.6	B	5.9	0.83	17.6	B	5.9
	Alewife Brook Parkway SB R	0.18	6.4	A	0.19	7.0	A	0.6	0.19	7.0	A	0.6	0.19	7.2	A	0.8	0.19	7.2	A	0.8
	OVERALL	**0.69**	**15.2**	**B**	**0.78**	**18.3**	**B**	**3.1**	**0.78**	**18.3**	**B**	**3.1**	**0.83**	**20.0**	**B**	**4.8**	**0.83**	**20.0**	**B**	**4.8**
Alewife Brook Parkway at Rindge Avenue	Rindge Avenue WB L	0.4	41.8	D	0.54	46.0	D	4.2	0.54	46.0	D	4.2	0.58	47.4	D	5.6	0.58	47.4	D	5.6
	Rindge Avenue WB R	0.39	42	D	0.39	42.0	D	0.0	0.39	42.0	D	0.0	0.49	44.9	D	2.9	0.49	44.9	D	2.9
	Alewife Brook Parkway NB T/R	1.59	308.9	F	2.01	497.9	F	189.0	2.01	497.9	F	189.0	2.12	544.5	F	235.6	2.12	544.5	F	235.6
	Alewife Brook Parkway SB T	1.22	113.5	F	1.33	162.9	F	49.4	1.33	162.9	F	49.4	1.41	197.8	F	84.3	1.41	197.8	F	84.3
	OVERALL	**0.9**	**177.6**	**F**	**1.12**	**287.0**	**F**	**109.4**	**1.12**	**287.0**	**F**	**109.4**	**1.19**	**320.8**	**F**	**143.2**	**1.19**	**320.8**	**F**	**143.2**
Alewife Brook Parkway at Cambridgepark Drive	Cambridgepark Drive EB L	0.17	19.1	B	0.17	19.1	B	0.0	0.17	19.1	B	0.0	0.17	19.2	B	0.1	0.17	19.2	B	0.1
	Cambridgepark Drive EB R	0.78	39.1	D	0.88	49.5	D	10.4	0.88	49.5	D	10.4	0.93	57.6	E	18.5	0.93	57.6	E	18.5
	Alewife Brook Parkway NB L	1.13	98.9	F	1.13	97.2	F	-1.7	1.13	97.2	F	-1.7	1.19	123.0	F	24.1	1.19	123.0	F	24.1
	Alewife Brook Parkway NB T	1.1	58.7	E	1.34	161.8	F	103.1	1.34	161.8	F	103.1	1.40	191.3	F	132.6	1.40	191.3	F	132.6
	Alewife Brook Parkway SB T	1.2	130.5	F	1.31	175.5	F	45.0	1.31	175.5	F	45.0	1.40	214.6	F	84.1	1.40	214.6	F	84.1
	Alewife Brook Parkway SB R	0.04	12.4	B	0.05	11.7	B	-0.7	0.05	11.7	B	-0.7	0.05	12.5	B	0.1	0.05	12.5	B	0.1
	OVERALL	**1.08**	**77.6**	**E**	**1.27**	**139.9**	**F**	**62.3**	**1.27**	**139.9**	**F**	**62.3**	**1.33**	**168.1**	**F**	**90.5**	**1.33**	**168.1**	**F**	**90.5**

Table 6.a.2 Signalized Intersection Level of Service (LOS) Analysis Results – Evening Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
Alewife Brook Parkway at Route 2/16	Route 2 (Signal 10b) EB L	0.91	63	E	0.91	63.0	E	0.0	0.91	63.0	E	0.0	0.96	70.8	E	7.8	0.96	70.8	E	7.8
	Route 2 (Signal 10d) EB R	0.4	8	A	0.42	8.2	A	0.2	0.42	8.2	A	0.2	0.45	8.5	A	0.5	0.45	8.5	A	0.5
	Alewife Brook Parkway (Signal 10b) SB T	0.38	8.3	A	0.38	8.3	A	0.0	0.38	8.3	A	0.0	0.47	9.5	A	1.2	0.47	9.5	A	1.2
	Alewife Brook Parkway (Signal 10b) NB L	0.32	7.8	A	0.32	7.8	A	0.0	0.32	7.8	A	0.0	0.33	7.9	A	0.1	0.33	7.9	A	0.1
	Alewife Station Exit Ramp (Signal 10c) WB T	1.1	60.2	E	1.24	122.1	F	61.9	1.24	122.1	F	61.9	1.30	148.6	F	88.4	1.30	148.6	F	88.4
	Alewife Station Exit Ramp (Signal 10c) WB R	0.35	29.3	C	0.57	31.0	C	1.7	0.57	31.0	C	1.7	0.60	31.3	C	2.0	0.60	31.3	C	2.0
	Alewife Brook Parkway (Signal 10c) NB T	0.47	43.8	D	0.57	45.8	D	2.0	0.57	45.8	D	2.0	0.59	46.5	D	2.7	0.59	46.5	D	2.7
	Alewife Brook Parkway (Signal 10a) SB R	0.95	48.4	D	0.95	48.5	D	0.1	0.95	48.5	D	0.1	0.98	53.1	D	4.7	0.98	53.1	D	4.7
	OVERALL		**40.8**	**D**		**61.1**	**E**	**20.3**		**61.1**	**E**	**20.3**		**72.0**	**E**	**31.2**		**72.0**	**E**	**31.2**
Massachusetts Avenue at Alewife Brook Parkway	Massachusetts Avenue EB L/T	0.57	53.5	D	0.57	53.5	D	0.0	0.57	53.5	D	0.0	0.58	53.8	D	0.3	0.58	53.8	D	0.3
	Massachusetts Avenue EB R	0.37	51.5	D	0.39	52.0	D	0.5	0.39	52.0	D	0.5	0.40	52.2	D	0.7	0.40	52.2	D	0.7
	Massachusetts Avenue WB L	1.41	273.5	F	1.45	289.6	F	16.1	1.45	289.6	F	16.1	1.48	303.5	F	30.0	1.48	303.5	F	30.0
	Massachusetts Avenue WB L/T/R	1.47	285.9	F	1.50	298.0	F	12.1	1.50	298.0	F	12.1	1.54	315.1	F	29.2	1.54	315.1	F	29.2
	Alewife Brook Parkway NB L	0.63	80.1	F	0.71	87.3	F	7.2	0.71	87.3	F	7.2	0.75	92.1	F	12.0	0.75	92.1	F	12.0
	Alewife Brook Parkway NB T/R	1.28	186.7	F	1.41	244.2	F	57.5	1.41	244.2	F	57.5	1.49	281.1	F	94.4	1.49	281.1	F	94.4
	Alewife Brook Parkway SB L	0.62	78.9	E	0.62	78.9	E	0.0	0.62	78.9	E	0.0	0.63	79.4	E	0.5	0.63	79.4	E	0.5
	Alewife Brook Parkway SB T	2.03	523.7	F	2.07	542.9	F	19.2	2.07	542.9	F	19.2	2.15	574.8	F	51.1	2.15	574.8	F	51.1
	Alewife Brook Parkway SB R	0.16	41.3	D	0.16	41.3	D	0.0	0.16	41.3	D	0.0	0.17	41.4	D	0.1	0.17	41.4	D	0.1
	OVERALL	**1.02**	**270.1**	**F**	**1.04**	**294.0**	**F**	**23.9**	**1.04**	**294.0**	**F**	**23.9**	**1.07**	**317.7**	**F**	**47.6**	**1.07**	**317.7**	**F**	**47.6**
Rindge Avenue at Sherman Street	Rindge Avenue EB T/R	0.2	14.6	B	0.26	15.3	B	0.7	0.26	15.3	B	0.7	0.30	15.8	B	1.2	0.30	15.8	B	1.2
	Rindge Avenue WB L/T	0.39	17.2	B	0.45	18.1	B	0.9	0.45	18.1	B	0.9	0.47	18.6	B	1.4	0.47	18.6	B	1.4
	Sherman Street NB L/R	0.75	44.2	D	0.75	44.2	D	0.0	0.75	44.2	D	0.0	0.77	46.0	D	1.8	0.77	46.0	D	1.8
	OVERALL	**0.49**	**27.7**	**C**	**0.52**	**27.1**	**C**	**-0.6**	**0.52**	**27.1**	**C**	**-0.6**	**0.55**	**27.8**	**C**	**0.1**	**0.55**	**27.8**	**C**	**0.1**
Garden Street at	Garden Street EB L/T/R	0.58	25	C	0.58	25.0	C	0.0	0.58	25.0	C	0.0	0.59	25.4	C	0.4	0.59	25.4	C	0.4

Table 6.a.2 Signalized Intersection Level of Service (LOS) Analysis Results – Evening Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Movement	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
Walden Street	Garden Street WB L/T/R	0.12	16.5	B	0.12	16.5	B	0.0	0.12	16.5	B	0.0	0.12	16.5	B	0.0	0.12	16.5	B	0.0
	Walden Street NB L/T/R	0.61	24.6	C	0.62	24.8	C	0.2	0.62	24.8	C	0.2	0.63	25.2	C	0.6	0.63	25.2	C	0.6
	Walden Street SB L/T/R	0.65	26.8	C	0.65	26.8	C	0.0	0.65	26.8	C	0.0	0.67	27.2	C	0.4	0.67	27.2	C	0.4
	OVERALL	**0.62**	**25**	**C**	**0.62**	**25.0**	**C**	**0.0**	**0.62**	**25.0**	**C**	**0.0**	**0.63**	**25.4**	**C**	**0.4**	**0.63**	**25.4**	**C**	**0.4**
Garden Street at Sherman Street/ Huron Avenue	Garden Street EB L/T/R	0.61	45.5	D	0.61	45.5	D	0.0	0.61	45.5	D	0.0	0.62	46.2	D	0.7	0.62	46.2	D	0.7
	Sherman Street SB L/T/R	0.67	46	D	0.67	46.0	D	0.0	0.67	46.0	D	0.0	0.68	46.6	D	0.6	0.68	46.6	D	0.6
	Huron Street NE L/T/R	0.74	28	C	0.75	28.4	C	0.4	0.75	28.4	C	0.4	0.76	29.3	C	1.3	0.76	29.3	C	1.3
	Huron Street SW L/T/R	0.78	43.1	D	0.78	43.1	D	0.0	0.78	43.1	D	0.0	0.79	43.5	D	0.4	0.79	43.5	D	0.4
	OVERALL	**0.63**	**36.8**	**D**	**0.63**	**36.9**	**D**	**0.1**	**0.63**	**36.9**	**D**	**0.1**	**0.64**	**37.5**	**D**	**0.7**	**0.64**	**37.5**	**D**	**0.7**

v/c = volume-to-capacity ratio (a value of 1.0 denotes at capacity)

Delay = average delay per vehicle, expressed in seconds

VLOS = vehicular level of service

Table 6.a.3 Unsignalized Intersection Level of Service (LOS) Analysis Results – Morning Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Approach	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
Concord Avenue at Spinelli Way	Concord Avenue EB L	0.04	0.4	A	0.05	9.4	A	9.0	0.05	9.6	A	9.2	0.05	9.6	A	9.2	0.05	10.0	A	9.6
	Concord Avenue EB T	0.45	0	A	0.76	0.0	A	0.0	0.72	0.0	A	0.0	0.78	0.0	A	0.0	0.78	0.0	A	0.0
	Concord Avenue WB T/R	0.25	0	A	0.42	0.0	A	0.0	0.40	0.0	A	0.0	0.43	0.0	A	0.0	0.43	0.0	A	0.0
	Spinelli Place SB L/R	0.29	11.8	B	0.60	29.2	D	17.4	0.17	13.1	B	1.3	0.29	19.8	C	8.0	0.20	14.4	B	2.6
Concord Avenue at Smith Place	Concord Avenue EB L/T	0.07	1.2	A	0.39	9.1	B	7.9	See Table 6.a.1 Signalized Intersection LOS – Morning Peak Hour				0.55	12.9	B	11.7	See Table 6.a.1 Signalized Intersection LOS – Morning Peak Hour			
	Concord Avenue EB T	0.24	0	A	0.29	0.0	A	0.0					0.29	0.0	A	0.0				
	Concord Avenue WB T/R	0.32	0	A	0.40	0.0	A	0.0					0.42	0.0	A	0.0				
	Smith Place SB L/R	0.08	9.2	A	0.75	40.2	E	31.0					1.71	385.5	F	376.3				
Concord Avenue at Wheeler Street	Concord Avenue EB L/T	0.03	0.4	A	0.04	1.3	A	0.9	0.04	1.3	A	0.9	0.00	0.0	A	-0.4	0.00	0.0	A	-0.4
	Concord Avenue EB T	0.23	0	A	0.33	0.0	A	0.0	0.33	0.0	A	0.0	0.38	0.0	A	0.0	0.38	0.0	A	0.0
	Concord Avenue WB T/R	0.35	0	A	0.68	0.0	A	0.0	0.68	0.0	A	0.0	0.75	0.0	A	0.0	0.75	0.0	A	0.0
	Wheeler Street SB L/R	0.1	9.5	A	0.13	12.4	B	2.9	0.13	12.4	B	2.9	0.10	12.4	C	2.9	0.25	15.4	C	5.9
Concord Avenue at New Main Street	Concord Street EB L/T	Not an existing intersection			0.27	0.0	A	n/a	0.53	0.0	A	n/a	0.28	0.0	A	n/a	0.56	0.0	A	n/a
	Concord Street WB T/R				0.41	0.0	A	n/a	0.41	0.0	A	n/a	0.48	0.0	A	n/a	0.48	0.0	A	n/a
	New Main Street SB L				0.03	16.8	C	n/a	0.03	18.0	C	n/a	0.02	12.7	B	n/a	0.05	22.5	C	n/a

v/c = volume-to-capacity ratio
Delay = average delay per vehicle, expressed in seconds
VLOS = vehicular level of service

Table 6.a.4 Unsignalized Intersection Level of Service (LOS) Analysis Results – Evening Peak Hour

		2024 Existing			2024 Build				2024 Build-Mitigated				2029 Future				2029 Future-Mitigated			
Intersection	Approach	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)	v/c	Delay	VLOS	Difference in Delay (to Existing)
Concord Avenue at Spinelli Way	Concord Avenue EB L	0.03	0.4	A	0.04	11.4	B	11.0	0.05	13.7	B	13.3	0.04	12.0	B	11.6	0.06	14.8	C	14.4
	Concord Avenue EB T	0.31	0	A	0.45	0.0	A	0.0	0.45	0.0	A	0.0	0.50	0.0	A	0.0	0.50	0.0	A	0.0
	Concord Avenue WB T/R	0.36	0	A	0.69	0.0	A	0.0	0.69	0.0	A	0.0	0.73	0.0	A	0.0	0.73	0.0	A	0.0
	Spinelli Place SB L/R	0.16	10	A	0.27	15.8	C	5.8	0.32	18.9	C	8.9	0.32	18.5	C	8.5	0.38	22.2	C	12.2
Concord Avenue at Smith Place	Concord Avenue EB L/T	0.04	0.7	A	0.21	6.3	A	5.6	See Table 6.a.2 Signalized Intersection LOS – Evening Peak Hour				0.25	7.1	A	6.4	See Table 6.a.2 Signalized Intersection LOS – Evening Peak Hour			
	Concord Avenue EB T	0.2	0	A	0.24	0.0	A	0.0					0.26	0.0	A	0.0				
	Concord Avenue WB T/R	0.28	0	A	0.44	0.0	A	0.0					0.44	0.0	A	0.0				
	Smith Place SB L/R	0.18	9.5	A	0.91	46.4	E	36.9					1.17	120.7	F	111.2				
Concord Avenue at Wheeler Street	Concord Avenue EB L/T	0.06	1	A	0.08	2.2	A	1.2	0.08	2.2	A	1.2	0.00	0.0	A	-1.0	0.10	2.6	A	1.6
	Concord Avenue EB T	0.23	0	A	0.46	0.0	A	0.0	0.46	0.0	A	0.0	0.52	0.0	A	0.0	0.52	0.0	A	0.0
	Concord Avenue WB T/R	0.3	0	A	0.47	0.0	A	0.0	0.47	0.0	A	0.0	0.55	0.0	A	0.0	0.55	0.0	A	0.0
	Wheeler Street SB L/R	0.16	9.7	A	0.17	11.3	B	1.6	0.17	11.4	B	1.7	0.07	10.6	B	0.9	0.15	13.3	B	3.6
Concord Avenue at New Main Street	Concord Street EB L/T	Not an existing intersection			0.25	0.0	A	n/a	0.50	0.0	A	n/a	0.29	0.0	A	n/a	0.57	0.0	A	n/a
	Concord Street WB T/R				0.45	0.0	A	n/a	0.45	0.0	A	n/a	0.46	0.0	A	n/a	0.46	0.0	A	n/a
	New Main Street SB L				0.05	14.2	B	n/a	0.09	20.5	C	n/a	0.05	13.2	B	n/a	0.09	21.4	C	n/a

v/c = volume-to-capacity ratio

Delay = average delay per vehicle, expressed in seconds

VLOS = vehicular level of service

Table 6.a.5 Rotary Intersection Level of Service (LOS) Analysis Results – Morning Peak Hour

		2024 Existing			2024 Build[2]				2029 Future[2]			
Intersection	Approach	Demand[1]	Delay	VLOS	Demand[1]	Delay	VLOS	Difference in Delay (to Existing)	Demand[1]	Delay	VLOS	Difference in Delay (to Existing)
Concord Avenue at Alewife Brook Parkway	Concord Avenue WB	1380	82.9	F	1550	115.8	F	32.9	1672	136.3	F	53.4
	Hotel Driveway SWB	55	13.1	B	55	16.6	C	3.5	56	17.8	C	4.7
	Alewife Brook Parkway SB	1600	90.8	F	1900	261.6	F	170.8	1990	328.1	F	237.3
	Concord Avenue EB	605	69.5	F	890	93.9	F	24.4	1048	143.4	F	73.9
	OVERALL	**3640**	**82.4**	**F**	**4395**	**173.0**	**F**	**90.6**	**4766**	**216.9**	**F**	**134.5**
Concord Avenue at Fresh Pond Parkway	Fresh Pond Parkway NB	850	277.7	F	975	548.5	F	270.8	991	616.4	F	338.7
	Concord Avenue WB	675	237.0	F	725	205.2	F	-31.8	808	255.0	F	18
	New Street SB	125	14.7	B	125	13.5	B	-1.2	134	14.2	B	-0.5
	Concord Avenue EB	1815	28.7	D	1945	39.7	E	11	2111	59.6	F	30.9
	OVERALL	**3465**	**131.8**	**F**	**3770**	**204.2**	**F**	**72.4**	**4044**	**235.8**	**F**	**104**

1-Approach volume in vehicles per hour.
2-Mitigation is not proposed at these study area intersections, therefore Build Mitigated and Future Mitigated scenarios are not applicable.

Table 6.a.6 Rotary Intersection Level of Service (LOS) Analysis Results – Evening Peak Hour

		2024 Existing			2024 Build[2]				2029 Future[2]			
Intersection	Approach	Demand[1]	Delay	VLOS	Demand[1]	Delay	VLOS	Difference in Delay (to Existing)	Demand[1]	Delay	VLOS	Difference in Delay (to Existing)
Concord Avenue at Alewife Brook Parkway	Concord Avenue WB	1035	43.6	E	1145	70.0	F	26.4	1266	81.4	F	37.8
	Hotel Driveway SWB	15	10.0	A	15	11.4	B	1.4	15	12.4	B	2.4
	Alewife Brook Parkway SB	1605	44.7	E	1785	117.3	F	72.6	1895	188.5	F	143.8
	Concord Avenue EB	585	59.8	F	1130	251.8	F	192	1287	287.3	F	227.5
	OVERALL	**3240**	**46.9**	**E**	**4075**	**140.7**	**F**	**93.8**	**4463**	**184.7**	**F**	**137.8**
Concord Avenue at Fresh Pond Parkway	Fresh Pond Parkway NB	655	79.9	F	720	267.3	F	187.4	769	401.8	F	321.9
	Concord Avenue WB	485	190.5	F	525	122.2	F	-68.3	586	143.6	F	-46.9
	New Street SB	110	14.1	B	110	11.9	B	-2.2	116	11.8	B	-2.3
	Concord Avenue EB	1685	21.5	C	1890	33.8	D	12.3	2069	53.1	F	31.6
	OVERALL	**2935**	**65.9**	**F**	**3245**	**104.8**	**F**	**38.9**	**3540**	**150.0**	**F**	**84.1**

1-Approach volume in vehicles per hour.
2-Mitigation is not proposed at these study area intersections, therefore Build Mitigated and Future Mitigated scenarios are not applicable.

6.a Signalized Intersections

Traffic flow across the study area intersections is largely characterized by regional travel patterns flowing into and out of Cambridge. Roadways along Routes 2 and 3 such as Fresh Pond Parkway, Alewife Brook Parkway, and Concord Avenue tend to serve both regional and local traffic. As the Quad grows over the next 25 years area traffic will grow, Some new trips will replace older trips from buildings that are being removed, which will help with the new increase. The current traffic models project that several intersections, while experiencing delays with specific movements, projecting to operate at a similar overall LOS during the AM and PM peak hours from Existing Conditions to Build and Build-Mitigated Conditions. The following locations are expected to see an impact to the overall level-of-service, during the noted peak hours:

- Concord Avenue at Blanchard Road/Griswold Street
  - PM Peak Hour – Under Existing Conditions, the intersection operates at LOS E and drops to LOS F with Build and Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 107 seconds, and with mitigation in place, the delay increase between Existing and Build-Mitigated Conditions is 40 seconds.
- Concord Avenue at Moulton Street
  - AM Peak Hour – Under Existing Conditions, the intersection operates at LOS A and drops to LOS B under Build and Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 9 seconds, and wi68th mitigation in place, the delay between Existing and Build-Mitigated Conditions increases by only 4 seconds.
  - PM Peak Hour – Under Existing Conditions, the intersection operates at LOS B and drops to LOS C under Build and Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 19 seconds, and with mitigation in place, the delay between Existing and Build-Mitigated Conditions increases by only 7 seconds.
- Concord Avenue at Fawcett Street
  - AM Peak Hour – Under Existing Conditions, the intersection operates at LOS B and drops to LOS F under Build Conditions and improves to LOS C Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 110 seconds, and with mitigation in place, the delay between Existing and Build-Mitigated Conditions increases by 13 seconds.
  - PM Peak Hour – Under Existing Conditions, the intersection operates at LOS and drops to LOS F under Build Conditions and improves to LOS D under Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 245 and with mitigation in place, the delay between Existing and Build-Mitigated Conditions increases by 25 seconds.
- Concord Avenue at Huron Avenue
  - PM Peak Hour – Under Existing Conditions, the intersection operates at LOS D and drops to LOS E under Build and Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 17 seconds and no mitigation is proposed.
- Concord Avenue at Garden Street
  - PM Peak Hour – Under Existing Conditions, the intersection operates at LOS C and drops to LOS D under Build and Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by only 3 seconds and no mitigation is proposed.
- Alewife Brook Parkway at Terminal Road/Fresh Pond Mall

- AM Peak Hour – Under Existing Conditions, the intersection operates at LOS B drops to LOS E under Build and Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 41 seconds and no mitigation is proposed.

› Alewife Brook Parkway at Rindge Avenue

- AM Peak Hour – Under Existing Conditions, the intersection operates at LOS E drops to LOS F under Build and Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 52 seconds and no mitigation is proposed.

› Alewife Brook Parkway at Cambridge Park Drive

- AM Peak Hour – Under Existing Conditions, the intersection operates at LOS D and drops to LOS E under Build and Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 40 seconds and no mitigation is proposed.
- PM Peak Hour – Under Existing Conditions, the intersection operates at LOS E and drops to LOS F under Build and Build-Mitigated Conditions. Between the Existing and Build Conditions, the delay increases by approximately 62 seconds (due to the Project and no mitigation is proposed.

6.b Unsignalized Intersections

› Concord Avenue at Spinelli Way

- AM Peak Hour –The Spinelli Place southbound approach operates at LOS B under Existing Conditions, LOS D under Build Conditions and LOS B under Build-Mitigated Conditions.
- PM Peak Hour –The Spinelli Place southbound approach operates at LOS A under Existing Conditions, LOS C under Build Conditions and Build-Mitigated Conditions.
- While no volumes from the Project are being added to Spinelli Place in either peak hour, the increase in volume on westbound and eastbound approaches decrease the frequency of gaps that would allow southbound traffic to enter Concord Avenue, thereby impacting LOS.

› Concord Avenue at Smith Place

- AM Peak Hour –The Smith Place southbound approach operates at LOS A under Existing Conditions, LOS E under Build Conditions, and LOS C under Build-Mitigated Conditions. The increased volumes from all approaches initially degrade LOS to an E in the Build Condition, but the addition of a signal improves overall LOS to a C (signal warrant discussed in Section 5).
- PM Peak Hour –The Smith Place southbound approach operates at LOS A under Existing Conditions, LOS E under Build Conditions and at LOS C under Build-Mitigated Conditions. Similar to the AM peak hour, adding a signal at this intersection improves LOS.

› Concord Avenue at Wheeler Street

- AM/PM Peak Hour –The Wheeler Street southbound approach operates at LOS A under Existing Conditions and operates at LOS B under Build-Mitigated Conditions.

6.c Rotary Intersections

The rotaries of Concord Avenue at Alewife Brook Parkway and Concord Avenue at Fresh Pond Parkway remain at LOS F across the Existing and Build Conditions. The only exception is during the PM Peak Hour when the Concord Avenue at Alewife Brook Parkway rotary drops from a LOS E in the Existing Condition to a LOS F in the Build Condition. The overall delay increases by 93.8 seconds.

7 Concord Avenue Corridor Study

As requested in the Scoping Determination, the Concord Avenue corridor study was conducted in support of the Project impact assessment. All vehicular access to the Quad currently and with the Project in place will be from Concord Avenue. The scope of the corridor analysis includes Concord Avenue generally between Blanchard Road/Griswold Street and Alewife Brook Parkway – which is approximately a 3,500-foot segment inclusive of five (5) key study area intersections.

The evaluation of the Concord Avenue corridor focused on opportunities to (1) better organize turning movements, (2) reduce vehicle queuing, improve vehicle circulation, delays, level of service, and (3) improve pedestrian and bicycle movements and crossings across Concord Avenue.

Under Existing Conditions, the majority of the Concord Avenue corridor provides two lanes eastbound and a single lane in the westbound direction, with a short section (approximately 100 feet) near Spinelli Place experiencing a neck-down to a single lane in each direction. Currently most side streets connecting to Concord Avenue from the north (the Quad) provide two-way access with a single lane in each direction. Concord Avenue at Wheeler Street restricts southbound left-turns from Wheeler Street onto Concord Avenue, as well as eastbound left-turns from Concord Avenue onto Wheeler Street.

Modeling Evaluation

VHB developed a traffic model with over five (5) test runs that each build on the previous run, to validate which geometric and operational changes yield preferred results. The scenarios that were evaluated include the following, and they are also summarized in Table 7.1 (with detailed modeling reports included in Appendix E):

- Test 1- Existing geometry with signalization at Smith Place at Concord Avenue and optimization of other existing signals (Blanchard, Moulton, Fawcett).
- Test 2 - Concord Avenue road diet. Corridor includes signalization at Smith Place and optimization of other existing signals (Blanchard, Moulton, Fawcett), plus lane geometry adjustments that re-assign the through-travel lanes to serve as turn-lanes at intersections only. This lane adjustment was evaluated at Smith Place, Moulton Street and Fawcett Street – providing additional storage capacity for vehicles turning into the Quad, while reducing capacity for vehicles progressing through the corridor on Concord Avenue. The lane adjustments assume existing street right-of-way dimensions, and they do not assume additional right of way.
- Test 3 – Concord Avenue Test 2 is carried over (signalization, optimization, turn lanes on Concord), in addition to adding southbound turn lanes on the side streets (Smith, Moulton, Fawcett), to evaluate changes to delays, queuing, and level of service.
- Test 4 – Existing geometry assumed for Concord Avenue (no road diet or turn lanes), and instead, the model tests changes of only having additional capacity on side streets, via added dedicated left- and right-turn lanes on the southbound approach to Concord Avenue for more efficient exiting from Smith Place, Moulton and Fawcett Streets.
    - Test 4a assumes Smith Place intersection as signalized in these model runs.
    - Test 4b assumes Smith Place not signalized
- Test 5a - Corridor includes signalization at Smith Place and optimization of other existing signals (Blanchard, Moulton, Fawcett), plus lane geometry adjustments that re-assign the

through-travel lanes to serve as turn-lanes at Smith and Fawcett intersections only (no dedicated turn lanes on Moulton eastbound). In addition to adding turn lanes on the side streets (Smith, Moulton, Fawcett), Test 5 is used to evaluate changes to delays, queuing, and level of service. Smith signal is coded to improve service/circulation and with an exclusive ped/bike phase for crossing Concord Avenue.

› Test 5b – Corridor includes signalization at Smith Place and optimization of other existing signals (Blanchard, Moulton, Fawcett), plus lane geometry adjustments that re-assign the through-travel lane to serve as turn-lanes at Smith only. No dedicated turn lanes on Moulton eastbound or Fawcett eastbound. In the westbound direction at Fawcett Street intersection, Concord Avenue is being widened to accommodate an exclusive right-turn lane to process vehicles entering Fawcett Street proceeding north.

Table 7.1 Concord Avenue Corridor Study – Traffic Model Test Runs

Concord Avenue Corridor	Impact evaluated:	Test 1	Test 2	Test 3	Test 4a	Test 4b	Test 5a	Test 5b
At Blanchard Street	Concord Turn-Lanes (Road Diet Opportunity)							
	Side Streets Turn-Lanes (Efficient Quad Departures)							
	Signalization	*exist*	*exist*	*exist*	*exist*	*exist*	*exist*	*exist*
	Signal Retiming / Split Optimization	●	●	●	●	●	●	●
At Smith Place	Concord Turn-Lanes (Road Diet Opportunity)		●	●			●	●
	Side Streets Turn-Lanes (Efficient Quad Departures)			●	●	●	●	●
	Signalization	●	●	●	●		●	●
	Signal Retiming / Split Optimization	●	●	●	●		●	●
At Moulton Street	Concord Turn-Lanes (Road Diet Opportunity)		●	●				
	Side Streets Turn-Lanes (Efficient Quad Departures)			●	●	●	●	●
	Signalization	*exist*	*exist*	*exist*	*exist*	*exist*	*exist*	*exist*
	Signal Retiming / Split Optimization	●	●	●	●	●	●	●
At Fawcett Street	Concord Turn-Lanes (Road Diet Opportunity)		●	●			●	
	Side Streets Turn-Lanes (Efficient Quad Departures)			●	●	●	●	●
	Signalization	*exist*	*exist*	*exist*	*exist*	*exist*	*exist*	*Exist*
	Signal Retiming / Split Optimization	●	●	●	●	●	●	●

For the purposes of the vehicle capacity evaluations within Sections 5 and 6, it is assumed that under all mitigated conditions, strategies from Test 5a are included. Discussion of the pros and cons of the remaining models are presented in Appendix E.

VHB will work with the City DOT to obtain guidance on additional evaluation needs of listed strategies.

Test 5a mitigation includes the following assumptions:

Concord Ave at Blanchard Road

- Optimization of signal timing splits and phasing for the existing signal

Concord Ave at Smith Place

- Introduction of a signal, including an exclusive ped/bike crossing across Concord Avenue
- Optimization of signal timing splits and phasing
- Eastbound: Existing left-thru lane, reallocated to a left-turn pocket at approach to intersection
- Westbound: Dimension from eastbound thru lane reallocated to a westbound right-turn pocket at approach to intersection
- Southbound: Turn lanes added for left-turns and right-turns, at approach to intersection.

Concord Ave at Moulton Street

- Southbound: Turn lanes added for left-turns and right-turns, at approach to intersection.
- Optimization of signal timing splits and phasing for the existing signal

Concord Ave at Fawcett Street

- Optimization of signal timing splits and phasing for the existing signal
- Eastbound: Existing left-thru lane, reallocated to a left-turn pocket at approach to intersection
- Westbound: Dimension from eastbound thru lane reallocated to a westbound right-turn pocket at approach to intersection
- Southbound: Turn lanes added for left-turns and right-turns, at approach to intersection.

The conditions of Test 5a were put in place for both the Build-Mitigated and Future-Mitigated Conditions of the Vehicle Capacity Analysis, and the results were demonstrated previously in Tables 6.a.1 through 6.a.4.

Additional Alternative at Concord Avenue/Fawcett Street Intersection

As an alternative to Test 5a - which assumes no roadway widening on Concord Avenue and only re-assigns the center lane to turn lanes - the team evaluated a modified version, Test 5b. Test 5b includes the addition of an exclusive right-turn lane on the Concord Ave westbound approach to Fawcett Street. This turn lane would allow vehicles destined for the Quad to be diverted from the through lane on Concord Ave, helping to reduce vehicle queues and delays, without impacting capacity in the eastbound Concord Ave approach to this intersection.

- **Test 5a:** No roadway widening on Concord Avenue; center lane reassigned to turn lanes.
    - AM peak: 25.2 sec (LOS C) Build-Mitigated; 39.0 sec (LOS D) Future-Mitigated
    - PM peak: 23.7 sec (LOS C) Build-Mitigated; 61.3 sec (LOS E) Future-Mitigated
- **Test 5b:** Adds a lane on the Concord Avenue westbound approach to Fawcett Street.
    - AM peak: 17.5 sec (LOS B) Build-Mitigated; 28.9 sec (LOS C) Future-Mitigated
    - PM peak: 33.1 sec (LOS C) Build-Mitigated; 60.2 sec (LOS E) Future-Mitigated

A geometric evaluation of this alternative is included in Appendix E, roadway plans. Detailed synchro results are included in Appendix E.

Geometric Evaluation

As requested in the TIS Scoping Determination, the following section discusses the team's exploration of potential additional options for connectivity in the area, specifically geometric

opportunities with the Concord Avenue corridor, which could improve transit, walking and biking conditions and provide more complete connections from the district as a whole.

While most parcels along Concord Avenue are not owned and controlled by the Proponent, this evaluation can serve to support future opportunities and strategies to guide area planning.

The evaluation considers and supports three initiatives that are important to the City of Cambridge for intersections and corridor planning including:

- **Vision Zero**[11] – "*…consists first and foremost of an acknowledgment that crashes are preventable. By examining the factors that cause crashes, from infrastructure to behavior to societal factors, changes can be made to eliminate traffic fatalities and serious injuries. Vizion zero was adopted in 2016 by the City of Cambridge, which lead to the release of the Vision Zero Action Plan in 2018. The Plan included changing the speed limit to 20mph on most Cambridge streets.*"
- **Complete Streets**[12] – "*…is an approach to planning, designing, building, operating, and maintaining streets that enables safe access for all people who need to use them, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.*"
- **Envision Cambridge**[13] - "*…is the comprehensive, citywide plan that contains actionable steps for creating the livable, sustainable, and equitable future community in Cambridge.*"

Exhibit 2 is provided for illustration purposes only to outline mitigation opportunities along Concord Avenue.

Potential Infrastructure Improvements

- Reconstruction of the north side of Concord Avenue, between E3 and R5, where proponent controls the frontage. Reconstruction to include a westbound cycle track with buffers to the travel lane and a separate landscape zone with wide sidewalks, as well as a floating bus stop near the intersection with Moulton Street.
- Re-alignment of Smith Place at Concord Ave intersection could improve sight lines at the intersection, re-align the multi-use path in a more intuitive way and would allow for a more efficient private parcel use in the northeast corner of the intersection.
- Signalization of Smith Place at Concord intersection would allow for better processing of vehicles (including cars, trucks, buses) and a controlled crossing for cyclists and pedestrians with a dedicated walk signal at the intersection. Crosswalk could be aligned with multiuse path on the Fresh Pond (south side) of Concord Avenue.
- Re-striping of travel lanes at strategic locations to allow for opportunities for lane re-assignments within the corridor, while maintaining capacity at intersections with turn-lane provisions. Model testing found that Smith Place at Concord Ave would support a re-assignment of lanes, while Moulton Street approaches are not supportive of a lane re-assignment. At Fawcett Street, the removal of a through lane to accommodate a turn lane, would also cause queuing along Concord Avenue to increase.

[11] VisionZero_ActionPlan.pdf

[12] Complete Streets - Smart Growth America

[13] Envision Cambridge Final Plan

- Installation of dedicated left-turn and right-turn lanes on side streets, would allow for more vehicle queuing storage capacity, which in turn would improve processing of vehicles, reducing

delay and improving vehicle level of service. More efficient processing of vehicles will cause less queueing buildup. Limiting queueing on side streets helps to control vehicle spillback that may reach potential upstream intersections, driveways, or crosswalks. A wide cross section on side street would be beneficial for truck maneuvering, access to/from Concord Avenue.

- Installation/upgrades to ADA ramps at Smith, Moulton, New Main Street and Fawcett Street intersections with Concord Avenue would improve safety at intersections for pedestrians and cyclists and people with limited mobility (elderly, disabled/wheelchair users, baby strollers).
- Re-striping of crosswalks at intersections allows for higher visibility and improved safety for pedestrians, cyclists, and drivers alike. .
- Replacement of outdated and damaged signage along the Concord Ave corridor (example signs: No Parking, Bus Stops, Regulatory/Speed) would improve wayfinding and make travel more efficient to and through the corridor.
- Due to the limiting dimensions of current Concord Avenue right-of-way, any widening of sidewalks, bike lanes or landscape buffers beyond what is proposed in this section would involve land takings and/or easements from private property owners along the north side of Concord Ave, and/or takings from the Fresh Pond side of Concord Ave, which may be protected conservation land.

Exhibit 2 - Concord Avenue Corridor Evaluation

8 Queue Analysis

Queue analysis was performed in combination with the vehicle LOS analysis. Per the City DOT Supplemental Guidelines, SimTraffic analysis software was used to supplement evaluation of queuing.

Observed queues documented in Section 2.b were used to calibrate the 2024 Existing Conditions of the Synchro model.

SimTraffic reports are included in Appendix H for further understanding. Tables 8.a.1 and 8.a.2 show the results for the observed and modeled average vehicle queues (expressed as the number of vehicles) for each scenario for the morning and evening peak hour, respectively.

The Scoping Determination also indicated that best practices should be used to calibrate the model to match existing conditions based on observations made. Working with the City DOT, VHB was instructed to calibrate the model at select locations by measuring saturation flow rate in the field and adjusting saturation flow rate accordingly in the model.

Saturation flow rate adjustments were made at the following locations during the AM peak hour using saturation flow rate collected via a third-party vendor:

1. Alewife Brook Parkway at Terminal Road / Fresh Pond Mall
    a. Alewife Brook Parkway NB Thru
    b. Alewife Brook Parkway SB Thru
2. Alewife Brook Parkway at Massachusetts Ave
    a. Massachusetts Ave EB Left/Thru
    b. Massachusetts Ave EB Thru
    c. Massachusetts Ave WB Left
    d. Massachusetts Ave WB Left/Thru

Saturation flow rate data used to adjust the model is included in Appendix G.

Table 8.a.1 Signalized Intersection Queue Analysis – Morning Peak Hour

		Average Queue (in Vehicles)					
Intersection	Lane Group	Observed	2024 Existing	2024 Build	2024 Build-Mitigated	2029 Future	2029 Future-Mitigated
Concord Avenue at Blanchard Road/Griswold Street	Concord Avenue EB L/T	5	9	15	12	15	15
	Concord Avenue EB T/R	4	6	14	9	14	13
	Concord Avenue WB L	5	6	13	13	13	13
	Concord Avenue WB T	4	5	8	7	8	7
	Concord Avenue WB R	4	3	4	4	4	4
	Blanchard Road NB L/T	6	12	12	13	10	11
	Blanchard Road NB R	0	0	0	0	0	0
	Blanchard Road SEB L/T/R	31	26	49	50	49	51
Concord Avenue at Moulton Street	Concord Avenue EB L/T	3	3	31	10	30	11
	Concord Avenue EB T/R	3	3	31	19	30	25
	Concord Avenue WB L/T/R	4	4	8	1	10	4
	Driveway NB L/T/R	0	0	0	0	0	0
	Moulton Street SB L/T	-	-	-	2	-	2
	Moulton Street SB L/T/R	1	1	3	-	4	-
	Moulton Street SB R	-	-	-	1	-	1
5. Concord Avenue at Fawcett Street[1]	Concord Avenue EB L	-	-	-	2	-	1
	Concord Avenue EB L/T	13	3	8	-	8	-
	Concord Avenue EB T	18	3	8	11	8	6
	Concord Avenue WB T	-	-	-	9	-	12
	Concord Avenue WB T/R	3	7	24	-	25	-
	Concord Avenue WB R	-	-	-	5	-	6
	Fawcett Street SB L	-	-	-	5	-	8
	Fawcett Street SB L/R	3	3	9	-	14	-
	Fawcett Street SB R	3	-	-	2	-	2
Concord Avenue at Walden	Concord Avenue EB L	1	1	1	1	11	2

Table 8.a.1 Signalized Intersection Queue Analysis – Morning Peak Hour

		Average Queue (in Vehicles)					
Intersection	**Lane Group**	**Observed**	**2024 Existing**	**2024 Build**	**2024 Build-Mitigated**	**2029 Future**	**2029 Future-Mitigated**
Street	Concord Avenue EB T/R	9	10	11	11	13	13
	Concord Avenue WB L/T/R	4	7	9	9	10	10
	Walden Street NB L/T/R	5	6	6	6	7	7
	Walden Street SB L/T/R	6	11	11	11	12	12
Concord Avenue at Huron Avenue	Concord Avenue EB L/T/R	6	7	9	9	11	11
	Concord Avenue WB L/T/R	10	10	11	11	13	13
	Huron Avenue NB L/T/R	8	11	12	12	13	13
	Huron Avenue SB L/T/R	9	8	8	8	9	9
Concord Avenue at Garden Street	Garden Street NB L/T	8	12	12	13	12	12
	Garden Street SB T	5	10	12	12	13	13
	Concord Avenue SEB T	12	5	5	5	6	6
Fresh Pond Parkway at Huron Avenue	Huron Avenue EB L	3	2	2	2	2	2
	Huron Avenue EB T	30	29	30	31	31	31
	Huron Avenue WB L	1	0	0	0	0	0
	Huron Avenue WB T/R	5	6	6	6	6	6
	Fresh Pond Parkway NB L/T	15	11	12	12	12	12
	Fresh Pond Parkway NB T/R	15	11	12	12	12	12
	Fresh Pond Parkway SB L/T	14	16	17	17	22	22
	Fresh Pond Parkway SB T/R	14	16	17	17	22	22
Alewife Brook Parkway at Terminal Road/Fresh Pond Mall	Terminal Road EB R	2	0	0	0	0	0
	Fresh Pond Mall Driveway WB R	7	1	2	2	2	2
	Alewife Brook Parkway NB T	26+	10	26	24	29	30
	Alewife Brook Parkway NB R	0	0	0	0	0	0
	Alewife Brook Parkway SB T	24+	10	13	13	41	41
	Alewife Brook Parkway SB R	0	0	1	1	1	1
Alewife Brook Parkway at	Rindge Avenue WB L	3	6	9	9	10	10

Table 8.a.1 Signalized Intersection Queue Analysis – Morning Peak Hour

		Average Queue (in Vehicles)					
Intersection	**Lane Group**	**Observed**	**2024 Existing**	**2024 Build**	**2024 Build-Mitigated**	**2029 Future**	**2029 Future-Mitigated**
Rindge Avenue	Rindge Avenue WB R	16	16	16	16	16	16
	Alewife Brook Parkway NB T/R	56+	42	70	69	72	72
	Alewife Brook Parkway SB T	6	10	10	11	10	11
Alewife Brook Parkway at Cambridgepark Drive	Cambridgepark Dr EB L	2	2	2	2	2	2
	Alewife Brook Parkway NB L	4	5	5	5	6	6
	Alewife Brook Parkway NB T	6	5	5	5	5	5
	Alewife Brook Parkway SB T	34	20	27	27	30	30
Alewife Brook Parkway at Concord Turnpike (Route 2)	Route 2 (Signal 10b) EB L	100+	100+	100+	100+	100+	100+
	Route 2 (Signal 10d) EB T	100+	100+	100+	100+	100+	100+
	Alewife Station Exit Ramp (Signal 10c) WB T	2	3	3	3	3	3
	Alewife Station Exit Ramp (Signal 10c) WB R	2	2	2	2	2	2
	Alewife Brook Parkway (Signal 10b) NB T	13+	18	13	13	13	11
	Alewife Brook Parkway (Signal 10c) NB T	3	2	3	3	3	3
	Alewife Brook Parkway (Signal 10b) SB T	14+	5	7	7	7	7
	Alewife Brook Parkway (Signal 10a) SB R	13+	20	20	20	21	21
Massachusetts Avenue at Alewife Brook Parkway	Massachusetts Avenue EB L/T	30	11	11	11	11	11
	Massachusetts Avenue EB T	30	11	11	11	10	11
	Massachusetts Avenue EB R	2	6	6	6	3	7
	Massachusetts Avenue WB L	50+	11	13	13	17	13
	Massachusetts Avenue WB L/T	50+	10	12	12	16	12
	Massachusetts Avenue WB T/R	5	6	6	6	7	7
	Alewife Brook Parkway NB L	3	3	4	4	4	4
	Alewife Brook Parkway NB T	3	10	11	11	12	12
	Alewife Brook Parkway NB T/R	2	10	11	11	12	12
	Alewife Brook Parkway SB L	13	2	2	2	3	3

Table 8.a.1 Signalized Intersection Queue Analysis – Morning Peak Hour

		Average Queue (in Vehicles)					
Intersection	**Lane Group**	**Observed**	**2024 Existing**	**2024 Build**	**2024 Build-Mitigated**	**2029 Future**	**2029 Future-Mitigated**
	Alewife Brook Parkway SB T	13	31	31	31	31	31
	Alewife Brook Parkway SB T/R	2	1	1	1	32	1
Rindge Avenue at Sherman Street[1]	Rindge Avenue EB T/R	1	1	1	1	1	1
	Rindge Avenue WB L/T	7	8	10	10	11	11
	Sherman Street NB L/R	1	4	4	4	4	4
Garden Street at Walden Street[1]	Garden Street EB L/T/R	2	5	5	5	1	5
	Garden Street WB L/T/R	1	1	1	1	1	1
	Walden Street NB L/T/R	4	3	3	3	3	3
	Walden Street SB L/T/R	3	12	12	12	12	12
Garden Street at Sherman Street at Huron Avenue[1]	Garden Street EB L/T/R	8	9	9	9	9	9
	Huron Avenue NB L/T/R	6	6	6	6	6	6
	Huron Avenue SB L/T/R	2	10	11	11	11	11
	Sherman Street SEB L/T/R	10	11	11	11	12	12

Source: Based on observations conducted by VHB on Wednesday, October 25, 2023, at most signalized intersections unless noted.

1 Based on observations conducted by VHB on Tuesday, October 29, 2024.

Notes: SimTraffic provides queue data in feet, the table presents queue data in number of vehicles. As directed by the TIS guidelines, 1 vehicle = 25 ft.

Table 8.a.2 Signalized Intersection Queue Analysis – Evening Peak Hour

		Average Queue (in Vehicles)					
Intersection	**Lane Group**	**Observed**	**2024 Existing**	**2024 Build**	**2024 Build-Mitigated**	**2029 Future**	**2029 Future-Mitigated**
Concord Avenue at Blanchard Road/Griswold Street	Concord Avenue EB L/T	5	4	7	7	9	9
	Concord Avenue EB T/R	5	4	7	7	9	9
	Concord Avenue WB L	9	8	20	16	24	18
	Concord Avenue WB T	4	6	11	10	14	12
	Concord Avenue WB R	4	5	24	22	28	24
	Blanchard Road NB L/T	9	10	12	13	13	13
	Blanchard Road NB R	0	0	0	0	0	0
	Blanchard Road SEB L/T/R	20	12	18	23	20	26
Concord Avenue at Moulton Street	Concord Avenue EB L/T	2	2	6	4	9	7
	Concord Avenue EB T/R	2	2	6	4	9	7
	Concord Avenue WB L/T/R	3	4	14	9	20	6
	Driveway NB L/T/R	0	1	1	1	0	1
	Moulton Street SB L/T	-	-	-	4	-	5
	Moulton Street SB L/T/R	1	3	5	-	5	-
	Moulton Street SB R	-	-	-	1	-	1
5. Concord Avenue at Fawcett Street[1]	Concord Avenue EB L	-	-	-	3	-	3
	Concord Avenue EB L/T	6	3	6	-	9	-
	Concord Avenue EB T	9	3	6	10	9	11
	Concord Avenue WB T	-	-	-	11	-	10
	Concord Avenue WB T/R	6	5	11	-	12	-
	Concord Avenue WB R	-	-	-	2	-	3
	Fawcett Street SB L	-	-	-	10	-	15
	Fawcett Street SB L/R	3	3	26	-	30	-
	Fawcett Street SB R	-	-	-	3	-	3
Concord Avenue at Walden Street	Concord Avenue EB L	4	3	3	3	3	3
	Concord Avenue EB T/R	10	11	15	15	17	17

Table 8.a.2 Signalized Intersection Queue Analysis – Evening Peak Hour

		Average Queue (in Vehicles)					
Intersection	Lane Group	Observed	2024 Existing	2024 Build	2024 Build-Mitigated	2029 Future	2029 Future-Mitigated
	Concord Avenue WB L/T/R	6	10	11	11	14	14
	Walden Street NB L/T/R	7	7	7	7	8	8
	Walden Street SB L/T/R	12	8	8	8	8	8
Concord Avenue at Huron Avenue	Concord Avenue EB L/T/R	11	9	14	14	16	16
	Concord Avenue WB L/T/R	4	12	13	13	16	16
	Huron Avenue NB L/T/R	8	8	9	8	8	8
	Huron Avenue SB L/T/R	6	9	9	9	9	9
Concord Avenue at Garden Street	Garden Street NB L/T	5	9	9	10	9	9
	Garden Street SB T	6	12	13	13	14	14
	Concord Avenue SEB T	5	5	5	5	6	6
Fresh Pond Parkway at Huron Avenue	Huron Avenue EB L	2	2	2	2	3	3
	Huron Avenue EB T	7	18	18	18	19	19
	Huron Avenue WB L	2	1	1	1	1	1
	Huron Avenue WB T/R	5	8	8	9	9	9
	Fresh Pond Parkway NB L/T	15	11	12	12	13	9
	Fresh Pond Parkway NB T/R	15	11	12	12	13	13
	Fresh Pond Parkway SB L/T	12	14	16	16	29	29
	Fresh Pond Parkway SB T/R	14	13	15	15	28	28
Alewife Brook Parkway at Terminal Road/Fresh Pond Mall	Terminal Road EB R	1	2	3	3	3	3
	Fresh Pond Mall Driveway WB R	0	7	10	10	10	10
	Alewife Brook Parkway NB T	7	12	19	19	21	21
	Alewife Brook Parkway NB R	0	0	1	1	1	1
	Alewife Brook Parkway SB T	24+	19	25	25	28	28
	Alewife Brook Parkway SB R	0	1	1	1	1	1
Alewife Brook Parkway at Rindge Avenue	Rindge Avenue WB L	2	3	4	4	4	4
	Rindge Avenue WB R	22	16	16	16	16	16

Table 8.a.2 Signalized Intersection Queue Analysis – Evening Peak Hour

		Average Queue (in Vehicles)					
Intersection	Lane Group	Observed	2024 Existing	2024 Build	2024 Build-Mitigated	2029 Future	2029 Future-Mitigated
	Alewife Brook Parkway NB T/R	56+	32	45	45	48	48
	Alewife Brook Parkway SB T	6	10	10	11	10	11
Alewife Brook Parkway at Cambridgepark Drive	Cambridgepark Dr EB L	4	2	2	2	2	2
	Alewife Brook Parkway NB L	4	4	3	3	3	3
	Alewife Brook Parkway NB T	7	5	6	6	6	6
	Alewife Brook Parkway SB T	34	33	44	45	45	46
Alewife Brook Parkway at Concord Turnpike (Route 2)	Route 2 (Signal 10b) EB L	100+	100+	53	53	55	54
	Route 2 (Signal 10d) EB T	100+	100+	50	55	59	58
	Alewife Station Exit Ramp (Signal 10c) WB T	15	6	5	5	9	7
	Alewife Station Exit Ramp (Signal 10c) WB R	15	3	2	3	3	3
	Alewife Brook Parkway (Signal 10b) NB T	15+	28	26	35	38	38
	Alewife Brook Parkway (Signal 10c) NB T	1	3	3	5	5	5
	Alewife Brook Parkway (Signal 10b) SB T	7	4	5	4	5	5
	Alewife Brook Parkway (Signal 10a) SB R	12	17	14	17	18	18
Massachusetts Avenue at Alewife Brook Parkway	Massachusetts Avenue EB L/T	8+	6	6	6	6	6
	Massachusetts Avenue EB T	8+	8	9	9	9	9
	Massachusetts Avenue EB R	4	4	5	5	5	5
	Massachusetts Avenue WB L	17	13	14	14	14	14
	Massachusetts Avenue WB L/T	17	14	14	14	15	15
	Massachusetts Avenue WB T/R	2	11	11	11	11	11
	Alewife Brook Parkway NB L	0	3	3	3	4	4
	Alewife Brook Parkway NB T	16	23	27	27	29	29
	Alewife Brook Parkway NB T/R	16	23	27	27	29	29
	Alewife Brook Parkway SB L	2	3	3	3	3	3
	Alewife Brook Parkway SB T	26	31	31	31	31	31

Table 8.a.2 Signalized Intersection Queue Analysis – Evening Peak Hour

		Average Queue (in Vehicles)					
Intersection	**Lane Group**	**Observed**	**2024 Existing**	**2024 Build**	**2024 Build-Mitigated**	**2029 Future**	**2029 Future-Mitigated**
	Alewife Brook Parkway SB T/R	26	30	30	30	30	30
Rindge Avenue at Sherman Street[1]	Rindge Avenue EB T/R	2	2	2	2	3	3
	Rindge Avenue WB L/T	8	6	7	7	7	7
	Sherman Street NB L/R	15	8	8	8	8	8
Garden Street at Walden Street[1]	Garden Street EB L/T/R	9	6	6	5	5	5
	Garden Street WB L/T/R	1	1	1	1	1	1
	Walden Street NB L/T/R	7	7	7	7	8	8
	Walden Street SB L/T/R	16	8	8	8	9	8
Garden Street at Sherman Street at Huron Avenue[1]	Garden Street EB L/T/R	1	3	3	3	3	3
	Huron Avenue NB L/T/R	0	12	12	12	12	12
	Huron Avenue SB L/T/R	3	8	8	8	8	8
	Sherman Street SEB L/T/R	3	4	4	4	4	4

Source: Based on observations conducted by VHB on Wednesday, October 25, 2023, at most signalized intersections unless noted.

1. Based on observations conducted by VHB on Tuesday, October 29, 2024

Notes: SimTraffic provides queue data in feet; the table presents queue data in number of vehicles. As directed by the TIS guidelines, 1 vehicle = 25 ft.

As directed in the Supplemental/Updated TIS Guidelines dated March 30, 2020, VHB compared the observed vehicular queues at intersection approaches with computer modeled queues.

Findings of Observed vs Modeled Queues

The following is a list of locations where observed queue and modeled queues significantly differ, all during the AM peak hour:

1. Concord Ave at Fawcett St (AM Peak Hour)
    a. Concord Ave EB differs between modeled and observed queues likely due to the impact of rotaries and limitations of Synchro/SimTraffic to model rotaries; The model showed a limited response to additional queues from the rotary that may cause backups on Concord Ave.
2. Alewife Brook Parkway at Terminal Road / Fresh Pond Mall (AM Peak Hour)
    a. Alewife Brook Parkway NB Thru – saturation flow rate adjustments were made at this location, though modeled queues continue to be lower than observed.
    b. Alewife Brook Parkway SB Thru - saturation flow rate adjustments were made at this location, though modeled queues continue to be lower than observed.
3. Alewife Brook Parkway at Massachusetts Ave (AM Peak Hour)
    a. Massachusetts Ave WB Left - saturation flow rate adjustments were made at this location, though modeled queues continue to be lower than observed.
    b. Massachusetts Ave WB Left/Thru - saturation flow rate adjustments were made at this location, though modeled queues continue to be lower than observed.

9 Residential Street Volume Analysis

Roadway segments within the study area with residential street frontage are evaluated for increased vehicle traffic volume as this is a Planning Board Criterion. The peak hour traffic volumes in both directions on the analyzed roadway segments are presented in Tables 9.a.1 and 9.a.2. For analyzed segments, the average vehicular volumes leaving and entering these intersections were taken as the volume traveling along the segment. The analysis shows the percent increase in traffic along the roadway segments between Existing and Build volumes and Existing and Future volumes.

Of all the roadway segments in the study area (the segment of road between the study area's intersections), a total of 25 of the 59 segments have more than 1/3 of residential frontage, as determined by the existing first floor use. These segments are evaluated in the Planning Board Criteria for increased volume on residential streets.

Table 9.a.1 Traffic Volumes on Study Area Roadways – Morning Peak Hour

Roadway	Segment	Amount of Residential Frontage	Existing[1]	Build	Increase[2]	Percent Increase	Future[3]	Increase	Percent Increase
Concord Avenue	Hamilton Road to Blanchard Road/Griswold Street	1/2 or more	516	656	140	27%	724	208	40%
	Blanchard Road/Griswold Street to Spinelli Place	1/3 or less	1,087	1,792	705	65%	1,953	866	80%
	Spinelli Place to Smith Place	1/3 or less	1,035	1,705	670	65%	1,867	832	80%
	Smith Place to Moulton Street	1/3 or less	1,013	1,440	428	42%	1,497	484	48%
	Moulton Street to Fawcett Street	1/3 or less	1,030	1,488	458	44%	1,639	609	59%
	Fawcett Street to Wheeler Street	1/3 or less	1,068	1,778	710	67%	1,994	927	87%
	Wheeler Street to Alewife Brook Parkway	1/3 or less	1,083	1,908	825	76%	2,163	1,081	100%
	Alewife Brook Parkway to Fresh Pond Parkway	1/3 or less	3,158	3,460	303	10%	3,736	578	18%
	Fresh Pond Parkway to Birch Street	1/3 or less	1,425	1,535	110	8%	1,677	252	18%
	Fayerweather Street to Walden Street	1/2 or more	935	1,040	105	11%	1,165	230	25%
	Walden Street to Appleton Street	1/2 or more	865	965	100	12%	1,053	188	22%
	Royal Avenue to Huron Avenue	1/3 or less	1,055	1,160	105	10%	1,253	198	19%
	Huron Avenue to Madison Street	1/3 or less	795	880	85	11%	949	154	19%
	Chauncy Street to Garden Street	>1/3 but <1/2	915	1,000	85	9%	1,051	136	15%
Blanchard Road	Merrill Avenue to Concord Avenue	1/2 or more	915	1,285	370	40%	1,354	439	48%
	Concord Avenue to Glenn Road	1/3 or less	886	1,081	195	22%	1,149	263	30%
Griswold Street	Concord Avenue to Sunset Road	1/2 or more	47	47	0	0%	52	5	11%
Spinelli Place	Concord Avenue to 44 Spinelli Pl	1/3 or less	145	145	0	0%	152	7	5%
Smith Place	Concord Avenue to Ashley Road/Wilson Road	1/3 or less	190	665	475	250%	832	642	338%
Moulton Street	Concord Avenue to Wilson Road	1/3 or less	55	200	145	264%	294	239	435%

Fawcett Street	Concord Avenue to 80 Fawcett St	1/3 or less	165	840	675	409%	919	754	457%
Wheeler Street	Concord Avenue to 29 Wheeler St	1/3 or less	125	240	115	92%	222	97	78%
Walden Street	Sherman Street to Garden Street	1/2 or more	795	800	5	1%	820	25	3%
	Garden Street to Fayerweather Street	1/2 or more	590	595	5	1%	610	20	3%
	Copley Street to Concord Avenue	1/2 or more	620	625	5	1%	650	30	5%
	Concord Avenue to Saville Street	1/2 or more	530	530	0	0%	569	39	7%
Huron Avenue	Cutler Ave to Garden Street/Sherman Street	1/2 or more	335	340	5	1%	348	13	4%
	Garden Street/Sherman Street to Daniel R Tierney Street	1/2 or more	555	560	5	1%	574	19	3%
	RC Kelley Street to Concord Avenue	1/3 or less	680	685	5	1%	713	33	5%
	Concord Avenue to Manassas Avenue	1/3 or less	530	545	15	3%	565	35	7%
	Fresh Pond Parkway to Larch Road	>1/3 but <1/2	690	690	0	0%	711	21	3%
	Larchwood Drive to Fresh Pond Parkway	1/2 or more	840	855	15	2%	883	43	5%
Garden Street	Ivy Street to Walden Street	1/2 or more	495	495	0	0%	507	12	3%
	Walden Street to Stearns Street	1/2 or more	280	280	0	0%	287	7	3%
	Winslow Street to Huron Avenue	1/2 or more	231	231	0	0%	237	6	3%
	Huron Avenue to Gray Gardens	1/2 or more	350	350	0	0%	359	9	3%
	Chauncy Street to Concord Avenue	1/3 or less	285	285	0	0%	314	29	10%
	Concord Avenue to Berkeley Street	1/3 or less	1,200	1,285	85	7%	1,364	164	14%
Alewife Brook Parkway	Concord Avenue to Terminal Road/Fresh Pond Mall	1/3 or less	2,663	3,188	525	20%	3,381	718	27%
	Terminal Road/Fresh Pond Mall to Rindge Avenue	1/3 or less	2,845	3,370	525	18%	3,579	734	26%
	Rindge Avenue to Cambridgepark Drive	1/3 or less	2,695	3,160	465	17%	3,359	664	25%
	Cambridgepark Drive to Rt 2/ Alewife Station Access Road	1/3 or less	2,645	2,990	345	13%	3,149	504	19%
	Rt 2/Alewife Station Access Road to Whittemore Avenue	1/3 or less	2,145	2,300	155	7%	2,404	259	12%
	Whittemore Avenue to Massachusetts Avenue	1/3 or less	1,975	2,125	150	8%	2,231	256	13%
	Massachusetts Avenue to Murray Hill Road	1/3 or less	1,420	1,515	95	7%	1,594	174	12%
Terminal Road	163 Terminal Road to Alewife Brook Parkway	1/3 or less	260	260	0	0%	267	7	3%
Fresh Pond Mall	Alewife Brook Parkway to Fresh Pond Mall	1/3 or less	135	135	0	0%	138	3	3%
Rindge Avenue	Alewife Brook Parkway to Clifton Street	>1/3 but <1/2	730	810	80	11%	869	139	19%
	Clay Street to Sherman Street	1/2 or more	675	755	80	12%	833	158	23%
	Sherman Street to Reed Street/ Sargent Street	1/2 or more	710	780	70	10%	844	134	19%
Cambridgepark Drive	Steel Place and Alewife Brook Parkway	1/3 or less	820	920	100	12%	965	145	18%

Alewife Station Access Road	Alewife Brook Parkway to Alewife Center	1/3 or less	315	315	0	0%	355	40	13%
Massachusetts Avenue	Lafayette St to Alewife Brook Parkway	1/3 or less	680	695	15	2%	720	40	6%
	Alewife Brook Parkway to Gladstone Street/Magoun Street	1/3 or less	1,005	1,055	50	5%	1,085	80	8%
Fresh Pond Parkway	Concord Avenue to Vassal Lane	1/3 or less	1,840	2,035	195	11%	2,150	310	17%
	Larch Road to Huron Avenue	1/2 or more	1,705	1,795	90	5%	1,907	202	12%
	Huron Avenue to Fresh Pond Lane	1/2 or more	1,615	1,690	75	5%	1,789	174	11%
Sherman Street	Rindge Avenue to Pemberton Street	1/2 or more	645	655	10	2%	686	41	6%
	Winslow Street to Huron Avenue	1/2 or more	351	351	0	0%	360	9	3%

1 Where driveways/on-street parking created a segment inflow/outflow volume imbalance, an average was calculated.

2 Net new project trips after trip credits are applied.

3 Future accounts for area background project volumes, Project-generated volumes, and a background growth rate of 0.5%.

Table 9.a.2 Traffic Volumes on Study Area Roadways – Evening Peak Hour

Roadway	Segment	Amount of Residential Frontage	Existing[1]	Build	Increase[2]	Percent Increase	Future[3]	Increase	Percent Increase
Concord Avenue	Hamilton Road to Blanchard Road/Griswold Street	1/2 or more	500	660	160	32%	718	218	44%
	Blanchard Road/Griswold Street to Spinelli Place	1/3 or less	1,078	1,863	785	73%	2,005	927	86%
	Spinelli Place to Smith Place	1/3 or less	1,013	1,758	745	74%	1,904	892	88%
	Smith Place to Moulton Street	1/3 or less	960	1,423	463	48%	1,482	522	54%
	Moulton Street to Fawcett Street	1/3 or less	983	1,498	515	52%	1,636	654	67%
	Fawcett Street to Wheeler Street	1/3 or less	1,045	1,830	785	75%	2,032	987	94%
	Wheeler Street to Alewife Brook Parkway	1/3 or less	1,030	1,860	830	81%	2,142	1,112	108%
	Alewife Brook Parkway to Fresh Pond Parkway	1/3 or less	2,693	3,005	313	12%	3,298	606	22%
	Fresh Pond Parkway to Birch Street	1/3 or less	1,155	1,280	125	11%	1,409	254	22%
	Fayerweather Street to Walden Street	1/2 or more	980	1,100	120	12%	1,216	236	24%
	Walden Street to Appleton Street	1/2 or more	945	1,060	115	12%	1,148	203	21%
	Royal Avenue to Huron Avenue	1/3 or less	960	1,075	115	12%	1,163	203	21%
	Huron Avenue to Madison Street	1/3 or less	785	885	100	13%	953	168	21%
	Chauncy Street to Garden Street	>1/3 but <1/2	845	945	100	12%	987	142	17%
Blanchard Road	Merrill Avenue to Concord Avenue	1/2 or more	875	1,285	410	47%	1,345	470	54%
	Concord Avenue to Glenn Road	1/3 or less	845	1,055	210	25%	1,116	271	32%
Griswold Street	Concord Avenue to Sunset Road	1/2 or more	39	39	0	0%	45	6	15%
Spinelli Place	Concord Avenue to 44 Spinelli Pl	1/3 or less	150	150	0	0%	157	7	5%

Smith Place	Concord Avenue to Ashley Road/Wilson Road	1/3 or less	180	695	515	286%	850	670	372%
Moulton Street	Concord Avenue to Wilson Road	1/3 or less	100	320	220	220%	401	301	301%
Fawcett Street	Concord Avenue to 80 Fawcett St	1/3 or less	175	905	730	417%	982	807	461%
Wheeler Street	Concord Avenue to 29 Wheeler St	1/3 or less	250	290	40	16%	292	42	17%
Walden Street	Sherman Street to Garden Street	1/2 or more	896	901	5	1%	924	28	3%
	Garden Street to Fayerweather Street	1/2 or more	635	640	5	1%	656	21	3%
	Copley Street to Concord Avenue	1/2 or more	725	730	5	1%	757	32	4%
	Concord Avenue to Saville Street	1/2 or more	530	530	0	0%	563	33	6%
Huron Avenue	Cutler Ave to Garden Street/Sherman Street	1/2 or more	422	427	5	1%	438	16	4%
	Garden Street/Sherman Street to Daniel R Tierney Street	1/2 or more	695	700	5	1%	718	23	3%
	RC Kelley Street to Concord Avenue	1/3 or less	680	685	5	1%	711	31	5%
	Concord Avenue to Manassas Avenue	1/3 or less	665	675	10	2%	698	33	5%
	Fresh Pond Parkway to Larch Road	>1/3 but <1/2	750	750	0	0%	773	23	3%
	Larchwood Drive to Fresh Pond Parkway	1/2 or more	887	902	15	2%	934	47	5%
Garden Street	Ivy Street to Walden Street	1/2 or more	460	460	0	0%	472	12	3%
	Walden Street to Stearn Street	1/2 or more	161	161	0	0%	165	4	3%
	Winslow Street to Huron Avenue	1/2 or more	130	130	0	0%	133	3	3%
	Huron Avenue to Gray Gardens	1/2 or more	150	150	0	0%	154	4	3%
	Chauncy Street to Concord Avenue	1/3 or less	165	165	0	0%	197	32	19%
	Concord Avenue to Berkeley Street	1/3 or less	1,010	1,110	100	10%	1,184	174	17%
Alewife Brook Parkway	Concord Avenue to Terminal Road/Fresh Pond Mall	1/3 or less	2,645	3,165	520	20%	3,357	712	27%
	Terminal Road/Fresh Pond Mall to Rindge Avenue	1/3 or less	2,940	3,460	520	18%	3,653	713	24%
	Rindge Avenue to Cambridgepark Drive	1/3 or less	2,830	3,310	480	17%	3,492	662	23%
	Cambridgepark Drive to Rt 2/Alewife Station Access Road	1/3 or less	2,760	3,155	395	14%	3,326	566	21%
	Rt 2/Alewife Station Access Road to Whittemore Avenue	1/3 or less	2,175	2,330	155	7%	2,412	237	11%
	Whittemore Avenue to Massachusetts Avenue	1/3 or less	2,140	2,280	140	7%	2,384	244	11%
	Massachusetts Avenue to Murray Hill Road	1/3 or less	1,530	1,610	80	5%	1,683	153	10%
Terminal Road	163 Terminal Road to Alewife Brook Parkway	1/3 or less	295	295	0	0%	302	7	3%

Fresh Pond Mall	Alewife Brook Parkway to Fresh Pond Mall	1/3 or less	365	365	0	0%	374	9	3%
Rindge Avenue	Alewife Brook Parkway to Clifton Street	>1/3 but <1/2	780	860	80	10%	928	148	19%
	Clay Street to Sherman Street	1/2 or more	595	675	80	13%	726	131	22%
	Sherman Street to Reed Street/Sargent Street	1/2 or more	460	525	65	14%	567	107	23%
Cambridgepark Drive	Steel Place and Alewife Brook Parkway	1/3 or less	890	935	45	5%	970	80	9%
Alewife Station Access Road	Alewife Brook Parkway to Alewife Center	1/3 or less	570	570	0	0%	654	84	15%
Massachusetts Avenue	Lafayette St to Alewife Brook Parkway	1/3 or less	860	875	15	2%	901	41	5%
	Alewife Brook Parkway to Gladstone Street/Magoun Street	1/3 or less	1,350	1,395	45	3%	1,440	90	7%
Fresh Pond Parkway	Concord Avenue to Vassal Lane	1/3 or less	1,605	1,790	185	12%	1,936	331	21%
	Larch Road to Huron Avenue	1/2 or more	1,695	1,795	100	6%	1,944	249	15%
	Huron Avenue to Fresh Pond Lane	1/2 or more	1,572	1,657	85	5%	1,788	216	14%
Sherman Street	Rindge Avenue to Pemberton Street	1/2 or more	435	450	15	3%	467	32	7%
	Winslow Street to Huron Avenue	1/2 or more	377	377	0	0%	387	10	3%

1 Where driveways/on-street parking created a segment inflow/outflow volume imbalance, an average was calculated.

2 Net new project trips after trip credits are applied.

3 Future accounts for area background project volumes, Project-generated volumes, and a background growth rate of 0.5%.

10 Parking Analysis

VHB developed parking supply and demand calculations based on four different methodologies.

(a) zoning calculation based on parking ratios previously referenced in the Alewife District Plan materials,

(b) employee density demand calculation,

(c) observed parking demand from city PTDM/survey data, and

(c) shared parking analysis based on observed occupancy at peak demand.

Initial findings show that on-site sharing of parking within a reasonable walking distance is possible and that the currently planned supply of 4,578 spaces is sufficient to meet the peak shared parking period for the proposed Project.

Parking Requirements

Establish maximum parking requirements, as a way to limit the amount of permitted parking and reduce unnecessary parking inventory instituted by parking minimums.

Maximum Number of Parking Spaces	
Retail	maximum 1.5 per 1,000 SF
Office	maximum 1.1 per 1,000 SF
R&D	maximum 0.8 per 1,000 SF
Industrial	maximum 0.5 per 1,000 SF
Residential	maximum 0.75 per dwelling unit minimum .25 per dwelling unit

Exhibit 3 - Alewife District Plan (Parking Requirements)

Of the 4,578 proposed parking spaces, 3,288 spaces are net-new, 651 reflect existing spaces that would be preserved and relocated from surface lots into structured parking, and 639 to be removed.

> *Existing Parking to Remain - Of the 651 existing parking spaces to remain, 325 spaces serve the Medical Office Building (MOB), 10 serve King Street, 8 serve retail on Fawcett Street, 260 serve the Fawcett Office Building, and 20 serve the DPW. Because no building modifications or changes in use are proposed, all existing parking spaces are proposed to be retained. Parking is a key component of the proponent's lease obligations.*

The following sections provide detailed calculations for each demand model, while Exhibit 6 graphically summarizes the resulting total numbers.

Parking demand is expected to evolve with the site buildout over the coming decades, and will therefore depend on flexible parking strategies developed in coordination with the City. The proponent will continue to monitor the competitive leasing environment to and will consider adjusting parking allocation, while remaining competitive. The proponent looks forward to additional conversations in this regard.

10.a Parking per Zoning Max Alewife District Plan Ratios

Within the Alewife Overlay District – Quadrangle, Cambridge Zoning Ordinance Section 20.1100.6 prescribes that the off-street parking requirements of Article 6.000 shall apply except as set forth in such section. Table 10.a.1 presents the resulting parking supply calculations set forth in the Cambridge Zoning Ordinance, and referenced in the Alewife District Plan.

Table 10.a.1 Parking per Zoning Maximum Alewife District Plan Ratios

Land Use	Development Program	Maximum Zoning Ratio	Maximum Number of Spaces
General Office[1]	1,280,500 SF	1.1 per 1,000 SF	1,409
Technical Office/Lab	1,260,500 SF	0.8 per 1,000 SF	1,008
Residential	1,985,000 SF (2,296 Units)	0.75 per Unit	1,722
Retail/Neighborhood Use	71,000 SF	1.5 per 1,000 SF	107
Total Spaces (Net New)	**4,597,000**		**4,246**

Source: Cambridge Zoning Ordinance 20.1100 text (as of April 2025)

1. DPW Yard - Includes approximately 20,000 SF of General Office use and 30,000 SF of storage space in connection with the DPW Yard Project. Parking generation assumed for 20,000 SF portion only

The total maximum parking spaces per zoning calculates to 4,246 spaces for the new development, with an additional 651 existing spaces to be maintained the total space count is **4,897**. The Project proposes to use shared parking within the Site to reduce the number of physical parking spaces built as part of the development. The zoning ratios are presented for informational purposes, and the calculated total of 4,897 spaces is used as a maximum from which to evaluate a reduced (adjusted) parking supply.

10.b Parking Demand by Employee Density

One way to estimate the technical office and general office parking demand is based on employee density. The calculation includes the expected number of employees or residents multiplied by their single occupancy vehicle ("SOV") mode share plus ½ high occupancy vehicle ("HOV") mode share.

Table 10.b.1 shows the estimated number of employees and residents and the calculated parking demand and effective parking ratio for the Project.

Table 10.b.1 Parking Demand by Person Density

Land Use	Development Program	Person Density[3]	Estimated Employees and Residents	Auto Use[1]	Estimated Parking Space Demand	Effective Parking Ratio[2]
General Office[4]	1,280,500 SF	3.0 per KSF	3,842	42.2%	1,621	1.27
Technical Office/Lab	1,260,500 SF	2.5 per KSF	3,151	42.2%	1,330	1.06
Residential	1,985,000 SF (2,296 Units)	2.0 per Unit	4,592	34.2%	1,568	0.68
Retail/Neighborhood Use	71,000 SF	2.0 per KSF	142	33.6%	48	0.67
Total	**4,597,000**		**11,727**		**4,567**	

1. Auto % = SOV% + (1/2)(HOV%)
2. Effective Parking Ratio = Est Parking Space Demand / Development Program

3. Office density from LEED14, Retail density from ITE, Residential assumed at 2 people per building code[15]
4. DPW Yard - Includes approximately 20,000 SF of General Office use and 30,000 SF of storage space in connection with the DPW Yard Project. Parking generation assumed for 20,000 SF portion only

The total estimated parking space demand from the density model is 4,567 spaces for new development, with an additional 651 existing spaces to be maintained total space count is **5,218.**

As noted previously, the Project proposes to use shared parking within the Site to reduce the number of parking spaces built as part of the development.

10.c Observed Demand Ratios

Another method used to estimate the Project's expected parking demand is based on existing parking patterns and activity at other nearby sites. The maximum observed demand ratios for seven commercial buildings and six residential buildings near the Quad were calculated using recent parking monitoring report data provided by the City of Cambridge.

Table 10.c.1 shows the observed maximum office/lab demand ratios calculated using PTDM and TDM reports, while Table 10.c.2 shows the maximum residential demand ratios calculated using the City's PTDM / TDM monitoring reports.

Table 10.c.1 Technical Office/Office Observed Maximum Demand Ratio

PTDM/TDM Site	Use	Year Reported	Occupied Office/R&D	Max. Observed Parking Demand	Max. Observed Demand Ratio[1]
200 Cambridgepark Drive	R&D	2022	211,329 SF	178 spaces	0.84
10 Wilson Road	Office	2022	107,239 SF	124 spaces	1.16
West Cambridge Science Park -767 Concord	R&D	2023	72,525 SF	75 spaces	1.03
75 Moulton Street	R&D	2022	36,304 SF	56 spaces	1.54
97 Cambridgepark Drive	Office/R&D		205,813 SF	122 spaces	0.59
Cambridge Discovery Park	Office/R&D	2023	647,157 SF	579 spaces	0.89
35 Cambridgepark Drive	R&D	2022	220,044 SF	185 spaces	0.84
				Average of Max. Parking Demand Ratios per KSF	**0.99**

Source: City of Cambridge PTDM / TDM monitoring report data

[1]Maximum Demand Ratio (parking spaces per KSF) = Maximum Parking Demand / Occupied KSF

[14] LEED Reference Guide for Green Building Design and Construction: *"…when final project occupancy counts are unavailable, default occupancy counts must be utilized. The default occupancy for R&D or laboratory buildings is 2.5 employees per KSF."*

[15] For R-2 residential dwelling units in Massachusetts, the State Building Code (780 CMR, based on the International Building Code) establishes occupant load on a per-dwelling-unit. Code officials and design professionals commonly assume approximately 1–2 occupants per bedroom for egress and plumbing/fixture calculations.

Table 10.c.2 Residential Observed Maximum Demand Ratio

PTDM/TDM Site	Use	Year Reported	Occupied Units	Max. Observed Parking Demand	Max. Observed Demand Ratio[1]
50 Cambridgepark Drive	Residential	2023	222	152 spaces	0.68
Vox on 2 (Rt 2 Residences)	Residential	2022	217	175 spaces	0.81
Atmark	Residential	2022	407	214 spaces	0.53
Windsor 160 Cambridgepark	Residential	2023	378	331 spaces	0.88
Fuse/WAFRA	Residential	2023	230	198 spaces	0.86
TEMPO - Concord TPKE	Residential	2022	309	219 spaces	0.71
				Average of Max. Parking Demand Ratios per Unit	**0.74**

Source: City of Cambridge PTDM / TDM monitoring report data
[1]Maximum Demand Ratio (parking spaces per dwelling unit) = Maximum Parking Demand / Occupied Units

For technical office and general office parking demand, the calculated average of all peak observed demand ratios from Table 10.c.1 is 0.99 spaces per KSF. For residential parking demand, the calculated average of all peak observed demand ratios from Table 10.c.2, is 0.74 spaces per unit.

For the retail/neighborhood uses, the parking ratio of 1.50 spaces per KSF was used for parking demand calculations, due to the lack of relevant PTDM/TDM data for retail/neighborhood uses sites in the Alewife Quad area. A higher parking ratio is believed to be appropriate for a use that intends to bring activity and energy into the Quad Site.

Table 10.c.3 presents the estimated parking space demand based on observed parking demands at nearby sites.

Table 10.c.3 Parking Based on Observed Maximum Demand Ratios

Land Use	Development Program	Parking Ratio	Estimated Parking Space Demand
General Office[1]	1,280,500 SF	0.99 per 1,000 SF	1,268
Technical Office/Lab	1,260,500 SF	0.99 per 1,000 SF	1,248
Residential	1,985,000 SF (2,296 Units)	0.74 per unit	1,700
Retail/Neighborhood Use	71,000 SF	1.50 per 1,000 SF	107
Total	**4,597,000**		**4,323**

[1] DPW Yard - Includes approximately 20,000 SF of General Office use and 30,000 SF of storage space in connection with the DPW Yard Project. Parking generation includes 20,000 SF portion only.

The total estimated parking space demand from the observed model is 4,323 spaces for new development, with an additional 651 existing spaces to be maintained total space count is **4,974.**

10.d Shared Parking Analysis

The concept of shared parking recognizes that peak activity for different land uses occur at various times of the day. Instead of building parking to support each individual land use's peak demand, the Site would supply enough parking to support the entire site's peak parking demand, assuming that

each land use will draw from a common parking supply. Shared parking leverages the peaking characteristics of its land uses, taking advantage of parking demand synergies. Due to parking demand issues, the shared parking concept is often viewed as most applicable to large mixed-use developments that have a large physically sharable parking supply, which can serve multiple users rather than one individual building with a limited parking supply.

The Proponent is committed in supporting the City's goal of lowering single occupant vehicle ("SOV") trips to/from the Cambridge area, by promoting alternative transportation mobility options in the neighborhood (Red Line train, MBTA buses, TMA shuttle bus, cycling and walking) and implementing shared parking.

A shared parking analysis was conducted to understand the Project's ability to share new parking spaces and possibly reduce the overall number of physical spaces built.

As requested in the City DOT Scoping Determination, and in the documentation provided by the City DOT staff, a shared parking analysis was conducted using observed parking utilization rates by land use from city's PTDM and TDM transportation monitoring reports described in previous sections.

Time of Day Distribution

A time-of-day distribution for the office/lab and residential components was calculated using the hourly garage occupancy for the PTDM and TDM sites described previously. For the retail/neighborhood land uses, where time of day distribution could not be calculated, the time-of-day distributions provided in the Urban Land Institute (ULI) Shared Parking Manual, Second Edition were used.

Table 10.d.1 shows the time-of-day distribution for key times throughout the day (6:00AM, 9:00AM, 12:00PM, 3:00PM, 6:00PM, and 10:00PM). For an hour-by-hour parking demand, refer to Appendix N.

The parking calculation was developed separately for three geographic zones within the proposed development. The zones are outlined as Zone 1 Mooney, Zone 2 Smith, and Zone 3 Fawcett – each zone covering an approximately 0.50-mile (or up to 10 minutes) walking shed, as illustrated within Exhibit 4.

As shown in Table 10.d.1, the peak shared parking demand for the Project is calculated at **4,578** parking spaces at noon, with 2,034 spaces in Zone 1 Mooney, 627 spaces in Zone 2 Smith and 1,917 spaces in Zone 3 Fawcett. The calculated "shared" demand of 4,578 spaces is 320 spaces less than if the parking was not shared between uses (unshared demand 4,898 spaces). The shared parking calculation is less than the zoning calculation total of 4,897, the density calculation total of 5,218 and the observation calculation total of 4,974.

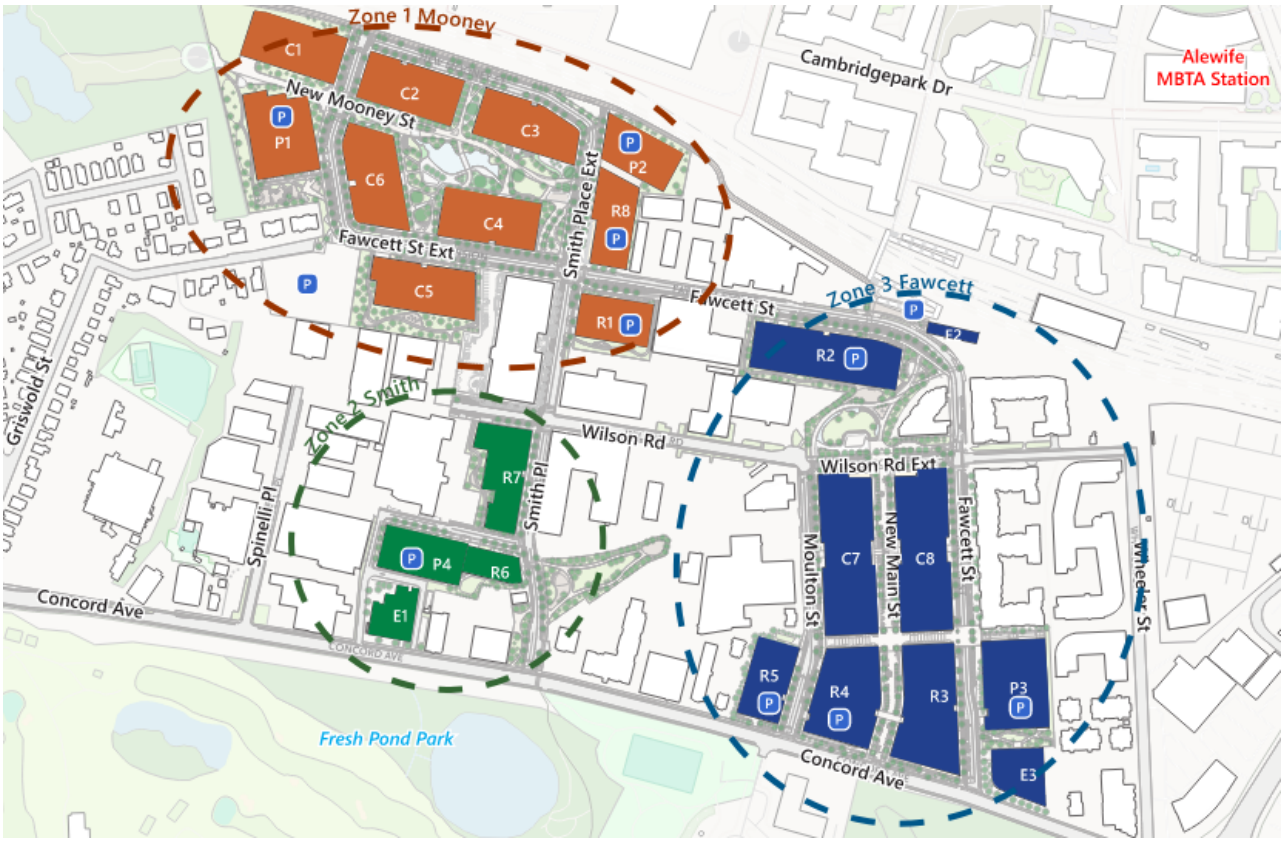

Exhibit 4 - Shared Parking Zones

Table 10.d.1 Shared Parking - Time of Day Distribution

Use	Program [1]	Parking Ratio	Unadjusted Parking Demand	6:00AM		9:00AM		Noon		3:00PM		6:00PM		10:00PM	
				Peak Hour Adjmt	Shared Parking Demand	Peak Hour Adjmt	Shared Parking Demand	Peak Hour Adjmt	Shared Parking Demand	Peak Hour Adjmt	Shared Parking Demand	Peak Hour Adjmt	Shared Parking Demand	Peak Hour Adjmt	Shared Parking Demand
Zone 1 Mooney															
General Office[2][3]	902 KSF	1.10	992	14%	138	76%	753	99.4%	986	77%	768	22%	223	7%	66
Technical Office/Lab	882 KSF	0.80	705	14%	98	76%	535	99.4%	701	77%	546	22%	158	7%	47
Residential R1/R8 (100% Reserved)	421 Units	0.75	*316*	*100%*	*316*	*100%*	*316*	*100.0%*	*316*	*100%*	*316*	*100%*	*316*	*100%*	*316*
Retail/Nbhd Uses (Employee)	7 KSF	1.50	2	10%	0	75%	2	100.0%	2	100%	2	95%	2	40%	1
Retail/Nbhd Uses (Patron)			9	1%	0	35%	3	95.0%	9	90%	8	95%	9	30%	3
Existing to Remain (Reserved)			*20*	*100%*	*20*	*100%*	*20*	*100.0%*	*20*	*100%*	*20*	*100%*	*20*	*100%*	*20*
Total			**2044**		**572**		**1629**		**2034**		**1660**		**728**		**453**
Zone 2 Smith															
Residential R6/R7 (40% Shared)	166 Units	0.75	125	84%	105	60%	75	57.0%	71	62%	78	81%	101	95%	119
Residential R6/R7 (60% Reserved)	250 Units	0.75	187	100%	187	100%	187	100.0%	187	100%	187	100%	187	100%	187
Existing to Remain (Shared)	*MOB and King St Lot*	*exist*	*369*	*14%*	*51*	*76%*	*280*	*100.0%*	*369*	*77%*	*286*	*22%*	*83*	*7%*	*25*
Total			**681**		**343**		**542**		**627**		**551**		**371**		**331**
Zone 3 Fawcett															
General Office	379 KSF	1.10	417	14%	58	76%	316	99%	414	77%	323	22%	94	7%	28
Technical Office/Lab	379 KSF	0.80	303	14%	42	76%	230	99%	301	77%	235	22%	68	7%	20
Residential R3/R4 (100% Shared)	765 Units	0.75	574	*84%*	*482*	*60%*	*343*	*57%*	*327*	*62%*	*358*	*81%*	*462*	*95%*	*547*
Residential R2/R5 (100% Reserved)	694 Units	0.75	521	*100%*	*521*	*100%*	*521*	*100%*	*521*	*100%*	*521*	*100%*	*521*	*100%*	*521*
Retail/Nbhd Uses (Employee)	64 KSF	1.50	18	10%	2	75%	14	100%	18	100%	18	95%	17	40%	7
Retail/Nbhd Uses (Patron)			78	1%	1	35%	27	95%	74	90%	70	95%	74	30%	23
Existing to Remain (Shared)			*262*	*14%*	*36*	*76%*	*199*	*100%*	*262*	*77%*	*203*	*22%*	*59*	*7%*	*17*
Total			**2173**		**1142**		**1650**		**1917**		**1728**		**1295**		**1163**
Grand Total			**4898**		**2057**		**3821**		**4578**		**3939**		**2394**		**1947**

1. As used in this Table, "square feet" represent square feet of Gross Floor Area ("GFA"), as such term is defined in Article 2.000 of the City of Cambridge Zoning Ordinance
2. Assumes 50% General Office and 50% Technical Office/Lab use for all buildings. Except for DPW Yard.
3. DPW Yard - Includes approximately 20,000 SF of General Office use and 30,000 SF of storage space in connection with the DPW Yard Project, which is anticipated to be exempt GFA pursuant to Section 20.1100.5.1.4.1(a).

10.e Proposed Parking Supply and Management

Parking Supply

The Project currently assumes a total parking supply of **4,578 spaces**, distributed approximately throughout the parking zones, per Table 10.e.1.

Table 10.e.1 Proposed Project Parking Supply

Shared Parking Zone	Parcel	Parking Spaces	Notes
Zone 1 Mooney	P1 Garage	620	
	P2 Garage	859	
	R1 Residential Building	160	
	R8 Residential Building	165	
	DPW Lot	20	Existing to remain as surface lot
	Total	**1,824**	
Zone 2 Smith	P4 Garage	630	
	Total	**630**	
Zone 3 Fawcett	P3 Garage	996	
	R2 Residential Building	330	
	R3 Residential Building	320	
	R4 Residential Building	300	
	R5 Residential Building	170	
	E2 Existing Retail	8	Existing to remain as surface lot
	Total	**2,124**	
Total Spaces		**4,578**	

The proposed parking supply is intended to satisfy the peak (noon time) shared parking demand for the Project of 4,578 spaces. Of this total number, 3,288 spaces are net-new, 651 reflect existing spaces that would be preserved and relocated from surface lots into structured parking, and 639 would replace spaces that have been removed from the Site.

The proposed supply was determined by reviewing parking demand models (density, observed/PTDM and zoning max calculations in previous sections) and aligning a shared parking methodology to limit the number of physical parking spaces to be built. The shared parking calculation is less than the zoning calculation total of 4,897, the density calculation total of 5,218 and the observation calculation total of 4,974.

Exhibit 5 illustrates the evaluated parking models – and highlights the proposed parking supply of 4,578 spaces in relationship to other models.

Exhibit 6 illustrates the relationship of unshared and shared demand and supply.

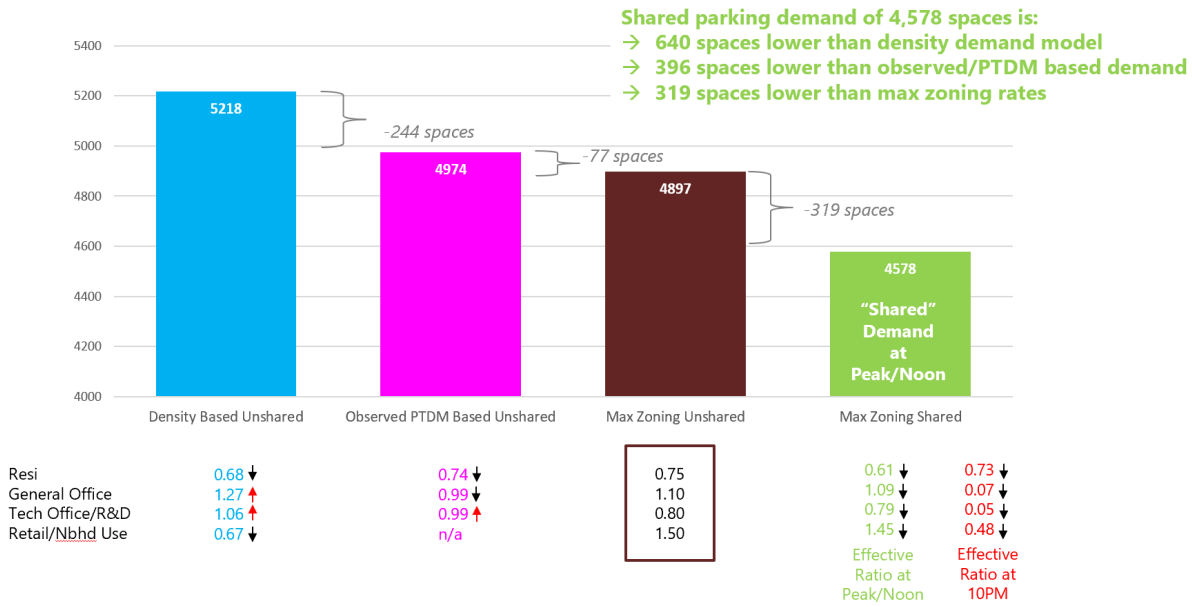

Exhibit 5 - Parking Demand Models (Graph)

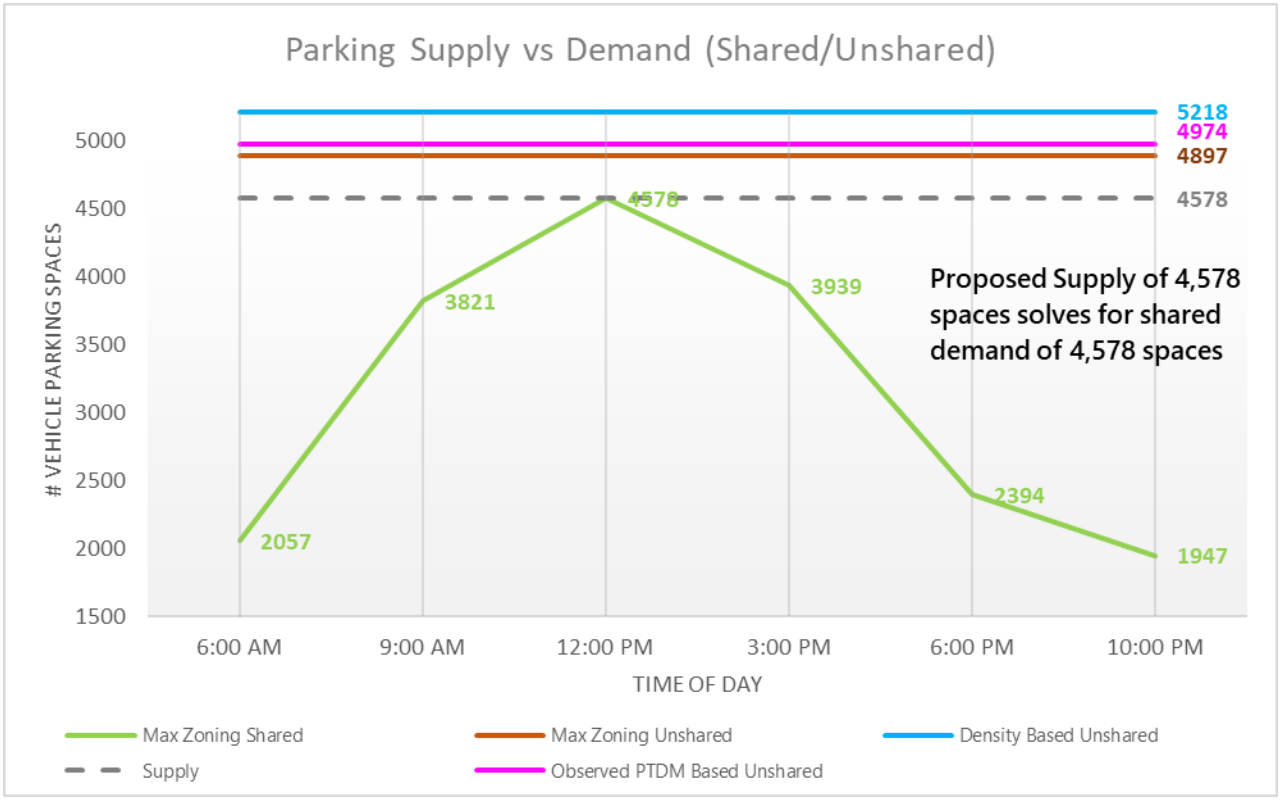

Exhibit 6 - Parking Supply vs Demand

On-Street / Curbside Spaces

Separate from off-street parking facilities discussed in previous sections, on-street parking will be provided along various internal roadways within the Quad. These on-street spaces will primarily serve retail patrons and visitors to the Site, with some strategically designed for short-term loading, passenger pickup/drop-off, accessible parking spaces and/or shuttle bus stops. The specific regulations governing these spaces will be finalized in coordination with the City.

On-street spaces are not intended for long-term parking and are therefore excluded from the total parking supply calculations. The curbside spaces are intended for temporary, short-term uses such as rideshare, food delivery, and passenger pickup/drop-off, limited 1-hr and/or 2-hr parking spaces; select locations will also accommodate shuttle bus stops. Curbside signage, regulations, and use will be coordinated with the DOT as part of the 40-scale plans.

As described in Section 1.c, there are currently 93 existing on-street spaces – a combination of publicly and privately owned - within the observed street segments of the Quad. The existing on-street spaces within the Development parcels will generally be upgraded or replaced as part of the Project construction. Table 10.f presents the anticipated on-street space supply within the Quad.

Table 10.f.1 Proposed On-Street Vehicle Parking Spaces

Street	Existing Spaces	Proposed/Maintained Spaces	Net-New Spaces
Smith Place	17	12	-5
Fawcett Street	62	79	+17
Moulton Street	14	16	+2
Wilson Road Extension	-	10	+10
New Main Street	-	32	+32
New Mooney Street	-	13	+13
Adley Street	-	10	+10
Total	**93**	**172**	**+79**

Parking Management

Due to the long buildout time of the Project, no detailed parking management system can be proposed at this time. However, the intent is to manage Project garages with state-of-the-art access technology.

The technical office/office and retail/neighborhood uses will be provided a fixed number of parking spaces. If the garage reaches capacity for either user group, the gate system will alert the driver that they are not permitted to park in the garage. Residential parking will be leased separately from each residential unit, and it is anticipated that some stand-alone residential buildings with on-site parking, will accommodate reserved spaces without sharing with the commercial side.

It is anticipated that a number of short-term on-street parking spaces will be made available as part of the reconstruction of Fawcett Street, Moulton Street, Smith Place, Mooney Street and Wilson Road and construction of New Main Street, as detailed in Section 10.f.

In addition to short-term on-street parking spaces, curb side loading opportunities will also be included at strategic locations to support deliveries and passenger loading activities that may not require the use of a loading dock. The exact location of such zones and appropriate signage will be coordinated with the City DOT at a later date.

Parking demand is expected to evolve with the site buildout over the coming decades, and will therefore depend on flexible parking strategies developed in coordination with the City. The proponent will continue to monitor the competitive leasing environment to and will consider adjusting parking allocation, while remaining competitive. The proponent looks forward to additional conversations in this regard.

11 Transit Analysis

Introduction

The transit analysis includes a review of existing Red Line and bus services and an assessment of the passenger crowding impacts of introducing Project-generated transit trips (riders) and future transit activity. The analysis considers typical weekday conditions and use.

The following sections summarize the assessment of the use of transit (ridership activity) relative to capacity of the transit services. The Project's transit riders could be expected to use the MBTA bus routes 74 and 78 (which operate along Concord Ave.), the MBTA Red Line at Alewife station, and to a lesser extent, bus routes 62, 67, and 76 (the existing Route 350 will not serve the Alewife area under Bus Network Redesign implementation).

Ridership data (typical weekday passenger activity) was obtained from the MBTA's Open Data Portal and through MassDOT's Office of Performance Management and Innovation (OPMI); the most recent data reflects Fall 2024 bus conditions and Fall 2023 Red Line conditions.

Summary of Findings

Bus Services Capacity Analysis

Under current service levels, Route 74 inbound, which serves the Project via Concord Avenue, could experience passenger crowding with the addition of Project-generated transit riders. However, with Bus Network Redesign Project, by 2029 the MBTA is anticipated to add peak period service to this route, which should alleviate the crowding condition. All other routes serving the Project area are expected to remain below the MBTA's passenger crowding threshold with the addition of Project-generated transit riders and with potential increases to ridership from other projects. Section 11.d contains the complete results of this analysis.

Red Line Capacity Analysis

The average peak passenger demand on the Red Line is expected to remain below the maximum policy capacity with the addition of Project-generated riders, even under current service operating levels. These results are presented next and depicted in Figure 10.d.6. Please see Appendix O (Transit Analysis, Table A.8 and Table A.9) for complete results.

11.a Analysis Methodology

Overview

This transit impact analysis associated with passenger crowding is based on quantifying ridership and service capacity for each of the transit modes (bus and Red Line), by applying the following method:

1. Quantify the transit system capacity, based on the MBTA's passenger comfort metric (aka passenger crowding threshold).

2. Quantify ridership to assess average peak passenger loads, under existing (baseline) conditions, future projects and background growth, and Project-generated transit trips (riders).
3. Perform a capacity analysis, assessing ridership vs. capacity (passenger crowding threshold), evaluating (a) Baseline conditions, (b) Baseline conditions with Project riders (Build condition), and (c) Future conditions with Project riders and background ridership.

The assessment results in a passenger V/C ratio (volume to capacity) metric that reflects the level of utilization at the peak passenger load point for each transit service. The V/C ratios are presented for the Existing (Baseline) Condition, Build Condition (Existing + Project trips), and Future (2029) Condition (Existing + Project trips + background growth).

This method identifies the service periods and segments in the MBTA system that may require additional service to address overcrowding (i.e., exceeding the MBTA's passenger comfort threshold). The transit capacity analyses are performed consistent with MBTA and MassDOT Office of Performance Management and Innovation (OPMI) analysis methods used since the issuance of the MBTA's 2017 *Service Delivery Policy*.

This transit capacity analysis method is often referred to as the peak load point or line haul analysis because it focuses on the service trip segment that experiences the highest passenger load, on average, for a typical weekday condition, based on the most recent MBTA data.

11.b Transit System Capacity

Overview

The passenger capacity of a transit service depends on (1) the number of trains (or buses) operating during a specified period (service frequency) and (2) the number of passengers that can be accommodated on a vehicle (bus or a train car and the number of cars in each train set), according to the MBTA's passenger crowding metric.

The capacity of the transit services is based on the MBTA's *Service Delivery Policy (SDP)*.[16] For the passenger comfort standard, which is based on vehicle capacity and riders, the standard sets the level of passenger crowding that is acceptable by transit mode and service period (or trip). Generally, the vehicle load assumes all seats on the vehicle will be occupied and some passengers may stand, too, before the condition is determined to be "overcrowded." The standard varies by service period: generally, high-volume, peak periods have a higher threshold than low-volume, off-peak periods. (In other words, the standard "accepts" more crowding during peak (rush hour) service than at other service periods of the day.)

The transit capacity analysis results in a comparison of the expected ridership demand for transit to the planned capacity of the service. For MBTA services, the service segments that are expected to be used by riders generated by the Project are identified. For each service, the peak passenger load point is identified: the peak passenger load point is the service segment

16 *Service Delivery Policy, 2021 Update*; Massachusetts Bay Transportation Authority (MBTA); adopted June 7, 2021. www.mbta.com/policies/service-delivery-policy

that is most crowded, based on existing ridership, by time of day. The peak passenger loads are then compared against the service's passenger capacity.

Bus Service Capacity

For bus service, the MBTA *Service Delivery Policy* expresses the maximum comfortable load as a ratio of the number of passengers on the vehicle to the number of seats on the vehicle. The maximum comfortable passenger-to-seat ratio for high-volume travel periods is 140%, whereas the maximum comfortable passenger-to-seat ratio for lower-volume travel periods is 125%.[17] Based on the typical 40-foot bus operated by the MBTA, this ratio corresponds to a policy capacity of 53 passengers per bus during both the weekday AM and PM peak periods, and 47 passengers per bus during off-peak periods and on weekends.[18] For this analysis, the peak periods are defined as Early AM/AM Peak from 6:00 AM–8:59 AM and PM Peak from 4:00 PM–6:29 PM.[19]

This analysis compares the existing average maximum passenger load to these capacity thresholds for each bus by service trip to determine if the route service is over capacity on any trips.

For analyzing future conditions, because the anticipated Bus Network Redesign Project schedules for the area routes have not yet been published, the crowding analysis is measured against the same level of service trips by time of day as Fall 2024 (baseline analysis year). (As noted in section 1.d, with the Bus Network Redesign Project, by 2029 the Project Site is anticipated to have about the same level of daily bus service along Concord Avenue and a slight increase in peak period trips.)

Red Line Capacity

Existing/Baseline Service

See Table 10.b.1 for details on MBTA Red Line capacity used in this analysis. The capacity of the Red Line for a 30-minute period depends on the service period and the frequency of trains.

Capacity Per Red Line Car: The *MBTA Service Delivery Policy (SDP)* defines the maximum passenger load of a Red Line train car: under the new Red Line train cars that have been added to service, the passenger comfort threshold is 186 for weekday peak periods, and 80 for weekday off-peak periods and weekends.[20] There are six cars to a Red Line train, which brings the total capacity of a single Red Line train to 1,116 passengers during peak periods and 480 passengers during off-peak periods. Peak service crowding standards are applied for the periods of 6:00 AM to 10:00 AM and 3:00 PM to 7:00 PM.

17 MBTA, *Service Delivery Policy, 2021 Update*; page 27-28.

18 MBTA, *Service Delivery Policy, 2021 Update*; Table B1: Bus and Trackless Trolley, Vehicle Load.

19 MBTA, *Service Delivery Policy, 2021 Update*; Table 2: MBTA Weekday Time Period Definitions.

20 Based on a peak and off-peak standees per square foot for Red Line Type 4 vehicles per proposed *SDP Proposed Updates* (2024-10-22), Section 10 (passenger comfort standards). The threshold is the average capacity per train cab in a married pair of a control cab and non-cab Type 4 vehicles. https://cdn.mbta.com/sites/default/files/2024-10/2024-10-22-service-delivery-policy-proposed-updates-summary.pdf

Capacity by Period: The frequency of service varies by time of day. The MBTA Rapid Transit schedule provides a range of 7-10 minutes as the scheduled headway of the Red Line. Upon consultation with OPMI, the analysis applies a peak service of 7-minute headways, with

transition periods of 8-minute headways, midday, and evening off-peak periods at 9-minute headways, and *Sunrise*, *Late Evening*, and *Night* periods operating at 10-minute headways.

Capacity Adjustment by On-Time Performance: To account for service reliability, when the Red Line is not operating at its regularly scheduled headways, we apply an adjustment to service capacity based on-time performance. This adjustment accounts for the reduced number of available trains during a service period, reflecting the service irregularities and resulting increased wait times experienced by passengers. For Fall 2023, the average weekday on-time performance was 90.4 percent.[21]

Table 10.b.1 MBTA Red Line Capacity by Service Period

Service Period	Time	Policy Capacity: Max Passenger Load per Car	Cars per Train	Service Headways (minutes)	Trains per 30 Minutes	Policy Capacity per 30 Minutes	Adjusted Capacity per 30 Minutes[1]
Sunrise	5:15 AM - 5:59 AM	80	6	9.0	3.3	1,607	1,453
Early AM	6:00 AM - 6:59 AM	186	6	8.0	3.8	4,190	3,787
AM Peak (Rush Hour)	7:00 AM - 8:59 AM	186	6	7.0	4.3	4,788	4,328
Midday Base (Transition 1)	9:00 AM - 9:59 AM	186	6	8.0	3.8	4,190	3,787
Midday Base (Transition 2)	10:00 AM - 10:59 AM	80	6	9.0	3.3	1,607	1,453
Midday Base	11:00 AM - 1:29 PM	80	6	9.0	3.3	1,607	1,453
Midday School	1:30 PM - 2:59 PM	80	6	9.0	3.3	1,607	1,453
Midday School (Transition)	3:00 PM - 3:59 PM	186	6	8.0	3.8	4,190	3,787
PM Peak	4:00 PM - 6:30 PM	186	6	7.0	4.3	4,788	4,328
Evening (Transition 1)	6:30 PM - 6:59 PM	186	6	7.0	4.3	4,788	1,634
Evening (Transition 2)	7:00 PM - 7:59 PM	80	6	8.0	3.8	1,808	1,307
Evening	8:00 PM - 9:59 PM	80	6	9.0	3.3	1,607	1,453
Late Evening (Late Night)	10:00 PM - 11:59 PM	80	6	10.0	3.0	1,446	3,787
Night (Late Night)	12:00 AM - 1:59 AM	80	6	10.0	3.0	1,446	4,328

Source: Calculation based on MassDOT OPMI and MBTA information, applying passenger comfort standards according to MBTA Service Delivery Policy (2021) and proposed SDP Update (10/22/2024), Section 10, for Red Line Type 4 vehicles.
1. Adjusted by applying the on-time performance factor to the policy capacity.

Future Service Capacity

As noted in Section 1.d, the MBTA's Red Line Systemwide Improvement Program (aka Red Line Transformation Project) is expected to result in better reliability and more frequent Red Line train service, and therefore, greater passenger capacity. The improvements would allow the MBTA to operate the Red Line at 3-minute headways during peak service, more than doubling its passenger capacity over the existing/baseline service conditions.

For simplicity in presenting the results of this transit capacity analysis, we maintain the baseline capacity for assessing Future Conditions passenger loads.

21 On-time performance is for the full route and is calculated for the weekdays during the period of September 1, 2023–December 21, 2023, excluding holidays (September 4, October 9, November 11, and November 23). Weekday on-time performance is available across peak periods instead of for each peak period individually. Data source: MBTA Open Data Portal, file *MBTA_Bus,_Commuter_Rail,_&_Rapid_Transit_Reliability*, https://mbta-massdot.opendata.arcgis.com/

11.c Transit System Ridership

Existing Ridership

MBTA Bus

Ridership activity on the MBTA's bus services is from Fall 2024 *Composite Day* data sets, obtained from MassDOT OPMI. These data sets reflect a typical weekday for each route, with average boardings, alightings, and passenger loads by stop/segment for each service trip.

MBTA Red Line

VHB reviewed the MBTA's data reflecting Fall 2023 *Passenger Load Profiles* (aka passenger flow data) to perform a Red Line passenger capacity (line haul) analysis. The capacity analysis is based on the maximum passenger load point on a line's service segment; the maximum load point is defined as the point along the line that carries the greatest number of passengers.

At Alewife station, most Red Line passengers board during the morning peak hour and alight in the evening peak hour (Table 10.c.1). The patterns of weekday ridership activity at Alewife station suggest that it is primarily used by passengers commuting into Cambridge and Boston.

Table 10.c.1 Study Area MBTA Services: Existing Ridership, Average Weekday Boardings

Route	Direction	AM Peak Hour	PM Peak Hour	Daily
Concord Avenue Services				
Route 74[1]	Inbound	76	40	508
	Outbound	22	80	529
Route 78[1]	Inbound	95	47	566
	Outbound	39	66	577
Services at Alewife Station				
Route 62[1]	Inbound	22	23	358
	Outbound	42	56	369
Route 67[1]	Inbound	37	5	136
	Outbound	23	28	196
Route 76[1]	Inbound	36	14	121
	Outbound	32	37	154
Route 350[1]	Inbound	43	64	*571*
	Outbound	45	41	*571*
Red Line	Northbound	223	695	5,512
	Southbound	952	387	4,915

Data sources: MBTA, Bus Composite Day data, Fall 2024; Red Line Passenger Flow data, Fall 2023.
Rounded values.
Red Line - AM Peak Hour: 7:30 -8:30 AM + PM Peak Hour: 4:30 – 5:30 PM
[1]MBTA Buses – peak hr of activity varies by route and direction: 74 Inbound 7-8 AM/4-5 PM; 74 Outbound 7-8 AM/6-7 PM; 78 Inbound 8-9 AM/3-4 PM; 78 Outbound 7-8 AM/3-4 PM; 62 Inbound 8-9 AM/4-5 PM; 62 Outbound 8-9 AM; 67 Inbound 7-8 AM/2-3 PM; 67 Outbound 7-8 AM/5-6 PM; 76 Inbound 7-8 AM/4-5 PM; 76 Outbound 7-8 AM/5-6 PM; 350 Inbound 7-8 AM/4-5 PM; 350 Outbound 7-8 AM/4-5 PM

Future Background Ridership (No-Build Growth)

MBTA Systemwide Growth

To estimate the expected growth in transit ridership between the Existing (Baseline) Condition and the future conditions, an average annual passenger growth rate is applied to the peak passenger loads. The growth rate is based on the Boston Region MPO CTPS Travel Demand Model projections for typical weekday ridership by transit service, as reported in the MPO's long-range regional transportation plan.[22] The travel demand model is used by CTPS to forecast future growth in transit activity based on expected changes in population, employment, and new urban development projects in the Boston metropolitan area.

The future conditions analysis for the Red Line applies an annual growth rate in passengers of 0.54 percent, based on the MPO's forecasts for changes in weekday ridership of Heavy Rail transit services. This growth rate is applied to the Fall 2023 passenger volumes as a basis for the 2030 No-Build Conditions. Similarly, the future conditions analysis for MBTA bus service uses an annual growth rate of 0.34 percent, based on MPO forecasts specific to MBTA bus service applied to the Fall 2024 passenger volumes.

Area Background Projects

The analysis examines a "no-build" demand by adding transit riders from known Project-area development projects that have been approved or that are under construction (Table 10.c.2). (Please refer to Appendix B for the complete trip generation estimates for these projects.) These projects are expected to add riders to the area's transit services, in addition to the Project-generated trips.

These anticipated riders are distributed onto the various MBTA service modes/routes and by time of day according to the same methods used for distributing Project riders onto the transit system.

Table 10.c.2 Background Project-Generated Transit Trips by Land Use Type, Weekday

	Daily Transit Trips	
Land Use Component	**Entering**	**Exiting**
Residential	441	441
Commercial	377	377
Total	**818**	**818**

Source: Background projects listed in Section 4. Complete background project materials are provided in Appendix B.

22 The annualized growth rate for subway and bus was calculated based on information presented in *Destination 2050, Long-Range Transportation Plan of the Boston Region Metropolitan Planning Organization*, prepared by the Central Transportation Planning Staff (CTPS), July 2023. https://arcg.is/08uOWG
The report provided projected ridership change between 2019 and 2050 for each transit mode, which was used by VHB to calculate an annualized growth rate for heavy rail and bus services.

Build Condition Ridership: Project-Generated Transit Trips

The analysis examines the Build demand and capacity by adding the Project-generated trips (riders) onto the various MBTA service modes/routes that serve the Project Site.

Table 10.c.3 lists the weekday daily Project-generated transit trips (riders) by land use. (Please refer to Section 3c for the complete trip generation by mode estimates for the Project.) These are distributed by time of day according to the methods outlined next.

Table 10.c.3 Project-Generated Transit Trips by Land Use Type, Weekday

Land Use Component	Daily Transit Trips	
	Entering	Exiting
Residential	1,910	1,960
Commercial	1,849	1,849
Active Use	1,254	1,254
Total	**5,013**	**5,063**

Project Transit Trip Distribution by Mode

For a more conservative analysis, when evaluating the passenger capacity of the Red Line, all (100 percent of) Project-generated transit trips (riders) are assigned to the service.

Regarding the assignment of transit riders to area buses, a share of 18 percent of the Project-generated transit trips are assigned to the bus services for the bus capacity analysis. This is the share of the combined Route 74 and Route 78 boardings relative to Alewife MBTA Station Red Line activity, which is used to represent the share of bus riders among the area's transit riders. This applies the existing weekday daily boarding activity of the Route 74 and Route 78 (entire route boarding, not simply boardings in the Project area), and the Red Line boardings that occur at the Alewife MBTA Station.

This allocation of transit riders to the area's bus riders are further assigned to the five area bus routes (the two Concord Avenue services and the three Alewife Station services) based on the share of a route's boardings relative to the area's total bus boardings.

For each of the Project area's bus services, Project-generated trips (riders) are distributed among the bus service's trips by direction (i.e., inbound, and outbound) in the same proportion as the existing service trip's passenger boardings by service segment for that trip. Because the Project Site is at a midpoint of Route 74 and Route 78 services, each route direction serves both Project riders traveling to the Site and from the Site.

The resulting distribution of Project riders traveling to and from the Site are shown in Table 10.c.4. The two Concord Avenue services comprise about 62 percent of the expected bus passenger boardings.

Table 10.c.4 Project-Generated Transit Trips by MBTA Bus Service, Weekday

Route	Share Among Area Bus Routes	Share of Service/Direction		Weekday Boardings	
		To Site (% In)	From Site (% Out)	To Site	From Site
Concord Ave. Bus Services					
Bus 74 Inbound	29.5%	30.0%	57.5%	80	155

Route	Share Among Area Bus Routes	Share of Service/Direction		Weekday Boardings	
		To Site (% In)	From Site (% Out)	To Site	From Site
Bus 74 Outbound		70.0%	42.5%	186	114
Bus 78 Inbound	32.5%	34.4%	55.6%	101	165
Bus 78 Outbound		65.6%	44.4%	192	132
Alewife Station Bus Connections					
Bus 62 Inbound	20.7%	100.0%	0.0%	186	-
Bus 62 Outbound		0.0%	100.0%	-	188
Bus 67 Inbound	9.5%	100.0%	0.0%	86	-
Bus 67 Outbound		0.0%	100.0%	-	86
Bus 76 Inbound	7.8%	100.0%	0.0%	71	-
Bus 76 Outbound		0.0%	100.0%	-	71
Daily Project Riders				**902**	**911**

Notes: Inputs to the passenger crowding analysis. Project-generated transit riders on local bus services.

Passenger Distribution by Time of Day

Existing use patterns are applied to represent the Project's use of the area's transit services. The bus ridership data published by the MBTA are available on a per trip basis whereas the Red Line ridership data is available on a half-hour period basis.

For a more conservative analysis, no existing Site credit is taken for these transit trips to estimate net-new impacts of Project Site riders.

Red Line Passenger Distribution

For the Red Line, Project-generated trips (riders) are distributed in half-hour periods based on land use type and direction of travel. Exiting Project-generated transit trips are considered as boarding passengers at Alewife going southbound on the Red Line and entering Project-generated trips are considered as alighting passengers at Alewife from the northbound Red Line. Table A.5 in the Appendix O (Transit Analysis) shows the distribution of all Project-generated trips by half-hour period, direction, and land use type.

The distribution by half hour period for Residential and Commercial trips was based on the existing percent distribution of boardings and alightings by half hour period at the Alewife MBTA Station (Table A.3 in Appendix O (Transit Analysis)). Because Residential and Commercial passenger activity are expected to follow opposing patterns (in and outbound trips by time of day), the percent distribution for Commercial trips follow a reverse pattern between 6:00 AM and 7:00 PM. The distribution by half hour period for Retail/neighborhood use trips (which represent a broad range of retail, restaurant, and similar uses) was based on *ITE Trip Generation Manual, 11th Edition* land use code 820 – Shopping Center (Table A.4 in Appendix O (Transit Analysis)).

Bus Passenger Distribution

For the time-of-day distribution of riders, these are distributed proportionally based on the bus service trip's share of the daily boardings for that route/direction.

11.d Transit Service Capacity Analysis

Applying the methodology, data inputs, and assumptions outlined above, the resulting capacity analysis is presented in this section.

The passenger capacity was analyzed for the analysis segment corresponding to the segment on which Project riders are expected to impact the peak load point of the service. For the MBTA bus services, the analysis segment included the entirety of the service route. The MBTA Red Line passenger capacity was analyzed for the segment between Alewife and Park Street stations. (At Park Street and Downtown Crossing, many Red Line passengers are expected to transfer to/from other subway services.)

Analysis Results

The most crowded condition during each peak period is presented in Table 10.d.1 and the accompanying figures (charts). The evaluation is made for the Existing Condition, the condition with Project riders added to the Existing Condition, and a condition with both Project riders and other expected future ridership added to the Existing Condition.

Please see Appendix O (Transit Analysis, Table A.8 and Table A.9) for a full analysis of each condition for the entire service day.

Under current service levels, Route 74 inbound, which serves the Project via Concord Ave., could experience passenger crowding with the addition of Project-generated transit riders. However, with the Bus Network Redesign Project, the MBTA is adding peak period service to this route, which should alleviate the crowding condition. All other routes serving the Project area are expected to remain below the MBTA's passenger crowding threshold with the addition of Project-generated transit riders and potential increases to ridership from other projects. These results are depicted in Figure 10.d.1.

The average peak passenger demand on the Red Line is expected to remain below the maximum policy capacity with the addition of Project-generated riders, even under current service operating levels. These results are depicted in Figure 10.d.6.

Table 10.d.1 MBTA Services Average Maximum Passenger Loads and V/C Ratio at Peak Load Point

Route	Direction	Weekday Peak Period	Existing Condition		Existing + Build Condition		Future Build Condition with Background Growth	
			Maximum Passenger Load	V/C Ratio	Maximum Passenger Load	V/C Ratio	Maximum Passenger Load	V/C Ratio
Concord Avenue Services								
Route 74	Inbound	AM	41.0	77.1%	54.4	102.3%	58.8	110.5%
		PM	20.4	38.3%	27.3	51.4%	30.3	56.9%
	Outbound	AM	21.5	40.4%	29.3	55.2%	31.0	58.3%
		PM	27.1	50.9%	37.2	69.9%	40.8	76.7%
Route 78	Inbound	AM	29.7	55.8%	39.5	74.3%	42.5	79.9%
		PM	25.6	48.1%	33.7	63.3%	36.9	69.5%
	Outbound	AM	21.2	39.8%	29.3	55.0%	31.0	58.3%
		PM	30.9	58.1%	42.4	79.8%	44.9	84.4%
Bus Services at Alewife Station								
Route 62	Inbound	AM	30.1	56.6%	47.2	88.7%	50.6	95.1%
		PM	22.7	42.7%	36.8	69.3%	39.6	74.4%
	Outbound	AM	19.9	37.4%	31.9	59.9%	34.2	64.3%
		PM	26.3	49.4%	41.0	77.1%	43.9	82.5%
Route 67	Inbound	AM	21.7	40.8%	38.5	72.3%	41.6	78.1%
		PM	5.9	11.1%	7.8	14.7%	8.2	15.4%
	Outbound	AM	9.3	17.5%	14.3	26.9%	15.3	28.7%
		PM	13.9	26.1%	20.9	39.2%	22.2	41.8%
Route 76	Inbound	AM	30.6	57.5%	45.7	85.8%	48.7	91.6%
		PM	21.3	40.0%	33.7	63.3%	36.1	67.9%
	Outbound	AM	20.3	38.2%	30.4	57.2%	32.5	61.1%
		PM	19.2	36.1%	28.6	53.8%	30.6	57.4%
Route 350[2]	Inbound	AM	20.4	38.3%	n/a	n/a	n/a	n/a
		PM	28.7	53.9%	n/a	n/a	n/a	n/a
	Outbound	AM	24.9	46.8%	n/a	n/a	n/a	n/a
		PM	19.4	36.5%	n/a	n/a	n/a	n/a
Subway Service at Alewife Station								
Red Line[3]	Southbound	AM	1,577	36.4%	1,864	43.1%	1,985	45.9%
		PM	1,593	36.8%	1,911	44.2%	2,029	46.9%
	Northbound	AM	1,486	34.3%	1,672	38.6%	1,730	40.0%
		PM	1,830	42.3%	2,097	48.5%	2,168	50.1%

Notes: Please refer to Appendix O for the full evaluation of passenger capacity, covering the entirety of a typical weekday service day.

Evaluated against *existing* service levels (the number of peak period trips); future conditions under the MBTA Bus Network Redesign Project and the Red Line Transformation Project service changes are expected to introduce more peak period service (i.e., increase capacity).

1. V/C = volume to capacity: ratio of passenger load against the MBTA's policy capacity threshold for passenger comfort.
2. Under its new Bus Network Redesign Project route, the Route 350 service will not be used by the Project riders.
3. Evaluated under existing service levels; future capacity is expected to increase with more frequent headways.

12 Pedestrian Analysis

12.a Pedestrian LOS

Pedestrian crossing volumes at study area intersections are presented in Figures 2.b.3 and 2.b.4. The results of pedestrian level of service ("PLOS") analysis at intersection crosswalks are presented in Table 11.a.1 for signalized intersections and Table 11.a.2 for unsignalized intersections, and Figures 11.a.1 and 11.a.2 graphically illustrate the PLOS for the Existing, build, and future conditions for morning and evening peak hour.

Pedestrian level of service at signalized intersections is dictated by the portion of the signal cycle dedicated to the pedestrian crossings. Accordingly, increasing pedestrian volumes does not alter pedestrian level of service at signalized intersections, and no changes in PLOS are projected under Build or Future conditions. It is assumed that the walk time and cycle length at these intersections will not change from Existing Conditions and therefore PLOS will remain constant.

For unsignalized intersections, the PLOS is calculated using the crosswalk length and the conflicting vehicle flow rates for morning and evening peak hours.

The unsignalized intersection of Concord Avenue at Spinelli Place experiences a change in PLOS with the addition of Project trips. During the morning peak hour, the eastern crosswalk at the intersection changes from PLOS D to E. During the evening peak hour, the western crosswalk at the intersection changes from PLOS E to F. The unsignalized intersection of Concord Avenue at Wheeler Street also experiences a change in PLOS with the addition of Project trips. During the morning and evening peak hours, the western crosswalk at the intersection changes from PLOS E to F.

All other intersections show no change in PLOS with the addition of Project trips or background growth. It should be noted that the PLOS for unsignalized intersections does not account for the Massachusetts State Law, which requires vehicles to yield to pedestrians at unsignalized intersections.

Table 11.a.1 Signalized Intersection – Pedestrian LOS Summary

		Morning Peak Hour			Evening Peak Hour		
Intersection	Crosswalk	2024 Existing	2024 Build	2029 Future	2024 Existing	2024 Build	2029 Future
Concord Avenue at Blanchard Road/ Griswold Street	East	F	F	F	E	E	E
	West	F	F	F	E	E	E
	North	F	F	F	E	E	E
	South	F	F	F	E	E	E
Concord Avenue at Smith Place	North	-	D	D	-	D	D
	West	-	D	D	-	D	D
Concord Avenue at Moulton Street	North	D	D	D	D	D	D
	East	D	D	D	D	D	D
Concord Avenue at Fawcett Street	West	D	D	D	D	D	D
	North	D	D	D	D	D	D

Table 11.a.1 Signalized Intersection – Pedestrian LOS Summary

Intersection	Crosswalk	Morning Peak Hour			Evening Peak Hour		
		2024 Existing	2024 Build	2029 Future	2024 Existing	2024 Build	2029 Future
Concord Avenue at Walden Street	East	C	C	C	C	C	C
	West	C	C	C	C	C	C
	North	B	B	B	B	B	B
	South	B	B	B	B	B	B
Concord Avenue at Huron Avenue	East	C	C	C	C	C	C
	West	C	C	C	C	C	C
	North	B	B	B	B	B	B
	South	B	B	B	B	B	B
Concord Avenue at Garden Street	Northwest	B	B	B	B	B	B
	South	D	D	D	D	D	D
Fresh Pond Parkway at Huron Avenue	East	E	E	E	E	E	E
	West	E	E	E	E	E	E
	North	E	E	E	E	E	E
	South	E	E	E	E	E	E
Alewife Brook Parkway at Terminal Road/Fresh Pond Mall	East	E	E	E	F	F	F
	West	E	E	E	F	F	F
	North	D	D	D	E	E	E
Alewife Brook Parkway at Rindge Avenue	East	E	E	E	E	E	E
	South	E	E	E	E	E	E
Alewife Brook Parkway at Concord Turnpike (Route 2)	East	E	E	E	E	E	E
Massachusetts Avenue at Alewife Brook Parkway	East	F	F	F	F	F	F
	West	F	F	F	F	F	F
	North	F	F	F	F	F	F
	South	F	F	F	F	F	F
Rindge Avenue at Sherman Street	East	D	D	D	D	D	D
	North	D	D	D	D	D	D
Garden Street at Walden Street	East	C	C	C	C	C	C
	West	C	C	C	C	C	C
	North	C	C	C	C	C	C
	South	C	C	C	C	C	C
Garden Street at Sherman Street at Huron Avenue	East	F	F	F	E	E	E
	West	F	F	F	E	E	E
	North	F	F	F	E	E	E
	Northwest	F	F	F	E	E	E
	South	F	F	F	E	E	E

Table 11.a.2 Unsignalized Intersection – Pedestrian LOS Summary

Intersection	Crosswalk	Morning Peak Hour			Evening Peak Hour		
		2024 Existing	2024 Build	2029 Future	2024 Existing	2024 Build	2029 Future
Concord Avenue at Spinelli Place	East	D	F	F	F	F	F
	North	A	A	A	A	A	A
Concord Avenue at Smith Place	West	F	Intersection is signalized in the Build and Future Conditions		E	Intersection is signalized in the Build and Future Conditions	
	North	A			A		
Concord Avenue at Wheeler Street	West	E	F	F	E	F	F
	North	A	A	A	A	A	A

12.b Pedestrian Access

The Quad currently lacks complete streets and dedicated pedestrian and cycling infrastructure to ensure safety and accessibility for all users. The proposed Project provides an opportunity to transform these streets into a multimodal network designed for pedestrians, cyclists, transit and shuttle riders, and drivers. It will deliver a robust pedestrian circulation system with generous sidewalks and walkways along internal roadways, and will create strong connections to the existing pedestrian realm on Concord Avenue and to the pathways around Fresh Pond.

A key element of this circulation network is New Main Street, a new north–south connection within the Quad that will bisect the block between Moulton Street and Facett Street and provide an alternative access into the Site from Concord Avenue. New Main Street is proposed as a shared street, prioritizing activation of ground-floor retail with a strong, high-quality pedestrian zone and limited vehicle access, supporting a vibrant, walkable environment at the heart of the district.

The Proponent is further enhancing pedestrian connectivity through widened sidewalks along major internal streets. These sidewalks will be expanded throughout the Site to improve connectivity, meet accessibility standards, and provide safer, more direct links to nearby infrastructure. Additional pedestrian walkways and paths will be integrated into new plazas and parks.

Connections between the Site and neighborhood to the north, across the railroad, will be provided via the Proposed Bridge. This bridge will supplement the existing route, which currently requires using Alewife Brook Parkway to travel between the Quad and the Triangle. Points east will be served by several new or improved connections, including the Wilson Road extension, Wheeler St extension and a potential Terminal Road connection identified in the City's visioning for the Alewife District. (See Section 14 for additional discussion on Terminal Rd).

To the west, the adjacent residential neighborhood will continue to rely primarily on Concord Avenue, with additional opportunities for walking and biking provided by a planned connection to Loomis Street and a planned multi-use path along the railroad right-of-way, as outlined in the City's 2020 Bike Plan. As part of the Project's enhanced pedestrian network, a segment of this envisioned multi-use path will be constructed along "New Mooney Street",

providing a 10-ft clear zone for pedestrians and bicycle use. Design and construction of this segment are subject to MBTA approval.

The pedestrian network will be supported by a comprehensive wayfinding signage program that directs people to nearby destinations and multimodal hubs via clear, safe, and convenient walking routes.

Pedestrian circulation and routing are illustrated in Figure E.a

13 Bicycle Analysis

13.a Conflicting Movements

TIS guidelines call for presenting the potential number of conflicting vehicle turning movements with bicycle movements at the study area intersections. These bicycle volumes are presented in Figure 2.b.5 and 2.b.6 and the conflicts are summarized in Table 12.a.1 for 2024 Existing, 2024 Build, and 2029 Future conditions.

Table 12.a.1 Conflicting Bicycle/Vehicle Movements at Study Area Intersections

Intersection	Time Period	Bicycle Direction	Existing Peak Hour Bicycle Volume	Conflicting Vehicle Movements					
				2024 Existing		2024 Build		2029 Future	
				Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]
Concord Avenue at Blanchard Road/Griswold Street	Morning	EB	22	25	125	25	195	26	212
		WB	1	85	41	210	41	223	45
		NB	3	170	230	295	475	326	510
		SB	2	5	1	5	1	5	1
	Evening	EB	15	20	185	20	315	21	340
		WB	13	225	45	510	45	531	52
		NB	8	125	105	205	230	225	251
		SB	4	10	5	10	5	10	5
Concord Avenue at Spinelli Place	Morning	EB	26	0	0	0	0	0	0
		WB	10	25	35	25	35	26	36
		SB	0	50	0	50	0	52	0
	Evening	EB	13	0	0	0	0	0	0
		WB	24	20	20	20	20	21	21
		SB	0	80	0	80	0	82	0
Concord Avenue at Smith Place	Morning	EB	0	0	0	0	0	0	0
		WB	20	70	60	120	300	136	402
		SB	3	40	0	145	0	179	0
	Evening	EB	1	0	0	0	0	0	0
		WB	19	15	30	80	145	92	176
		SB	9	80	0	350	0	440	0
Concord Avenue at Moulton Street	Morning	EB	28	10	10	10	10	10	10
		WB	15	25	10	50	10	121	10
		NB	0	5	15	5	80	5	103
		SB	0	5	5	60	5	60	5
	Evening	EB	2	5	10	5	10	5	10
		WB	16	5	5	45	60	65	60
		NB	0	15	60	15	155	15	215
		SB	0	30	15	60	15	61	15
Concord Avenue at Fawcett Street	Morning	EB	37	0	0	0	0	0	0
		WB	20	55	15	385	165	412	166

Table 12.a.1 Conflicting Bicycle/Vehicle Movements at Study Area Intersections

Intersection	Time Period	Bicycle Direction	Existing Peak Hour Bicycle Volume	Conflicting Vehicle Movements					
				2024 Existing		2024 Build		2029 Future	
				Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]
		SB	6	20	0	75	0	81	0
	Evening	EB	14	0	0	0	0	0	0
		WB	17	40	20	165	90	200	95
		SB	3	20	0	175	0	178	0
Concord Avenue at Wheeler Street	Morning	EB	0	0	0	0	0	0	0
		WB	14	40	20	155	20	124	0
		SB	45	50	0	50	0	50	0
	Evening	EB	0	0	0	0	0	0	0
		WB	33	90	55	130	55	160	60
		SB	49	85	0	85	0	43	0
Concord Avenue at Alewife Brook Parkway	Morning	NWB	32	55	0	55	0	57	0
	Evening	NWB	48	25	0	25	0	26	0
Concord Avenue at Fresh Pond Parkway	Morning	WB	26	390	0	390	0	405	0
	Evening	WB	30	380	0	380	0	401	0
Concord Avenue at Walden Street	Morning	EB	3	10	5	10	5	11	5
		WB	1	35	35	35	40	36	43
		NB	5	5	10	5	10	5	10
		SB	7	55	10	55	10	64	10
	Evening	EB	4	15	15	15	15	16	15
		WB	5	105	110	105	115	108	121
		NB	6	5	10	5	10	5	10
		SB	4	25	10	25	10	31	10
Concord Avenue at Huron Avenue	Morning	EB	3	40	10	45	10	49	10
		WB	9	30	40	30	45	31	49
		NB	15	5	5	5	5	5	5
		SB	11	180	50	180	60	192	65
	Evening	EB	5	115	30	120	30	126	31
		WB	9	45	55	45	60	46	65
		NB	13	10	10	10	10	10	10
		SB	7	80	20	80	25	88	28
Concord Avenue at Garden Street	Morning	SB	26	0	425	0	460	0	498
	Evening	SB	24	0	475	0	505	0	538
Fresh Pond Parkway at Huron Avenue	Morning	EB	14	45	5	45	5	46	5
		WB	4	10	70	10	75	10	76
		NB	1	45	5	45	5	46	9
		SB	6	100	0	110	0	120	0
	Evening	EB	2	20	10	20	10	21	10
		WB	16	10	60	10	65	11	69
		NB	2	70	5	70	5	72	9

Table 12.a.1 Conflicting Bicycle/Vehicle Movements at Study Area Intersections

Intersection	Time Period	Bicycle Direction	Existing Peak Hour Bicycle Volume	Conflicting Vehicle Movements					
				2024 Existing		2024 Build		2029 Future	
				Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]
		SB	5	150	2	160	2	171	2
Alewife Brook Parkway at Terminal Road/Fresh Pond Mall	Morning	EB	0	25	0	25	0	26	0
		WB	2	85	0	85	0	87	0
		NB	15	50	0	50	0	51	0
		SB	19	235	0	235	0	241	0
	Evening	EB	2	85	0	85	0	87	0
		WB	19	255	0	255	0	261	0
		NB	13	110	0	110	0	113	0
		SB	35	210	0	210	0	215	0
Alewife Brook Parkway at Rindge Avenue	Morning	WB	0	450	0	450	0	471	0
		NB	44	130	0	150	0	177	0
		SB	1	0	0	0	0	0	0
	Evening	WB	0	470	0	470	0	504	0
		NB	26	200	0	240	0	263	0
		SB	1	0	0	0	0	0	0
Alewife Brook Parkway at Cambridgepark Drive	Morning	EB	0	465	0	565	0	586	0
		NB	0	0	0	0	0	0	0
		SB	0	110	130	110	130	113	149
	Evening	EB	0	485	0	530	0	551	0
		NB	0	0	0	0	0	0	0
		SB	0	45	130	45	130	46	137
Alewife Brook Parkway at Concord Turnpike (Route 2)	Morning	NB	0	0	0	0	0	0	0
	Evening	NB	1	0	0	0	0	0	0
Massachusetts Avenue at Alewife Brook Parkway	Morning	EB	131	130	345	140	375	149	384
		WB	20	15	30	15	30	15	31
		NB	1	155	60	170	65	179	67
		SB	22	30	60	30	65	31	69
	Evening	EB	40	95	340	100	355	102	364
		WB	111	40	55	40	55	41	56
		NB	1	315	75	345	75	364	77
		SB	1	50	80	50	90	51	96
Rindge Avenue at Sherman Street	Morning	EB	15	115	200	125	200	129	205
		WB	8	0	0	0	0	0	0
		NB	2	40	0	40	0	41	0
	Evening	EB	5	50	50	65	50	68	51
		WB	13	0	0	0	0	0	0
		NB	1	75	0	75	0	77	0
Garden Street at Walden	Morning	EB	35	15	20	15	20	15	21

Table 12.a.1 Conflicting Bicycle/Vehicle Movements at Study Area Intersections

Intersection	Time Period	Bicycle Direction	Existing Peak Hour Bicycle Volume	Conflicting Vehicle Movements					
				2024 Existing		2024 Build		2029 Future	
				Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]
Street		WB	12	5	85	5	85	5	87
		NB	3	10	10	10	10	10	10
		SB	2	155	5	155	5	159	5
	Evening	EB	15	10	5	10	5	10	5
		WB	29	1	150	1	150	1	154
		NB	7	15	5	15	5	15	5
		SB	6	150	15	150	15	154	15
Garden Street at Sherman Street at Huron Avenue	Morning	EB	44	10	0	10	0	10	0
		WB	18	0	16	0	16	0	16
		NB	1	45	5	45	5	46	5
		SEB	33	150	0	150	0	154	0
		SB	8	35	70	35	70	36	72
	Evening	EB	15	5	0	5	0	5	0
		WB	46	0	10	0	10	0	10
		NB	7	20	5	20	5	21	5
		SEB	4	70	0	70	0	72	0
		SB	2	50	245	50	245	51	251

a Advancing volume

b Opposing volume

NA Movement not available

13.b Bluebikes Analysis

A comprehensive Bluebikes system analysis of the nearby stations is provided. VHB staff reviewed historic Bluebikes utilization data to understand activity entering and exiting the stations near the Site. Data was analyzed from Thursday, September 18, 2025 as a typical day. The demand of the eight (8) stations located in the Quad and Triangle was recorded each hour throughout the study period. The bikeshare demand results are reported in Table 12.b.1.

Table 12.b.1 Existing Bluebikes Occupancy – Thursday, September 18, 2025

Time	101 Smith Place		Smith Place at Wilson Rd		Concord Ave at Spinelli Place		55 Wheeler St		84 CPD		87-101 CPD		Alewife at Steel Place		Alewife at Russell Field	
	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit
7 AM	0	0	0	0	0	0	2	0	0	0	0	1	1	8	0	1
8 AM	0	0	1	2	2	2	8	2	0	0	1	0	2	10	4	4
9 AM	0	0	1	0	3	1	3	3	0	0	0	1	7	6	0	4
10 AM	0	0	1	0	0	2	2	1	1	0	0	0	0	1	0	0
11 AM	0	0	0	1	0	1	0	0	0	0	0	0	1	0	2	1
12 PM	0	0	1	0	1	2	4	3	0	0	0	1	1	1	0	1
1 PM	0	0	0	0	0	0	0	0	1	0	1	0	0	2	1	0
2 PM	0	0	1	1	0	0	1	2	1	2	2	1	1	3	0	2
3 PM	0	0	1	0	1	2	3	2	1	4	1	0	3	2	2	1
4 PM	0	0	0	0	2	3	4	2	0	1	0	1	10	0	3	2
5 PM	1	0	0	0	1	0	5	2	2	1	1	4	10	9	7	7
6 PM	0	0	0	0	1	0	0	6	0	0	4	1	5	3	5	3
7 PM	0	0	0	0	0	0	2	6	0	2	0	0	0	0	6	1
Total	**1**	**0**	**6**	**4**	**11**	**13**	**34**	**29**	**6**	**10**	**10**	**10**	**41**	**45**	**30**	**27**

Source: Bluebikes.com, Thursday 09/18/2025

As identified in Table 12.b.1, bikes are available at each of the 8 docks in the area throughout most of the evaluated 12-hour study day. The station located at the Alewife MBTA Station receives the most variation in bike occupancy.

13.c Bicycle Access

The Quad currently lacks safe, direct connections to external bicycle paths and infrastructure, as described in Section 1.a.. In particular, the northwestern portion of the Quad has no safe bicycle routes due to the poor condition and configuration of existing roadways. The proponent is committed to significantly improving bicycle access both within the Quad and to surrounding networks and destinations.

As part of the Project separated bike lanes, provided through horizontal buffers or vertical grade separation, are proposed along major roadways, including Fawcett Street, Fawcett Street Extension, Smith Place, Smith Place Extension and most notably Concord Avenue along proponent's frontage. Off-street bicycle and shared-use paths will also be provided at key locations within the Quad, linking external existing paths to the Proposed Bridge and to future off-street facilities anticipated to be delivered by by others. The planned bicycle network will

directly connect to proposed Bluebikes stations and long-term bicycle parking facilities as outlined in Sections 13.b and 13.d.

The proposed bicycle improvements will be supported by a coordinated and legible wayfinding signage program that directs riders to nearby bicycle routes, parking facilities, Bluebikes stations (including those referenced in Sections 1.a, 13.b, and 13.d), the Alewife MBTA Station, and the Proposed Bridge. The intent of this wayfinding system is to guide cyclists to key destinations via dedicated on-street bicycle facilities, low-volume local streets, and off-street shared-use paths wherever feasible.

Refer to Figure E.b for an illustration of the proposed bicycle circulation plan.

13.d Bicycle Parking

The Site will provide short-term and long-term bicycle parking per the City of Cambridge Bicycle Parking Zoning requirements.

Elevators sized to accommodate bicycles are being provided for each bicycle parking Site that is not at ground level or accessible via a ramp.

Bicycle circulation, parking, and locations of Bluebikes stations are illustrated in Figures D.a and E.b.

The Project will be supported by a total of approximately 3,076 long-term bicycle parking spaces and 440 short-term bicycle parking spaces. Electric outlets will be provided within bike rooms, to support charging of micromobility devices.

The Project proposes to provide up to five (5) 19-dock Bluebikes stations to support the new development, with preliminary station locations identified in Figure D, final locations to be developed with the City's Bluebike station team in coordination with adjacent building/site designs.

Table 13.b.1 provides a summary of the required minimum bicycle parking. Figures H.a-H.as illustrate the location and layout of the long-term and short-term bicycle parking spaces and associated amenities.

Table 13.b.1 Proposed Bicycle Parking Summary

	Parking Ratios		**# of Long-Term Bicycle Spaces Required**	**# of Short-Term Bicycle Spaces Provided**
Land Use	Long-Term	Short-term		
General Office	0.30 spaces per KSF	0.06 spaces per KSF	384	76
Technical Office/Lab	0.22 spaces per KSF	0.06 spaces per KSF	277	77
Retail/Restaurant (average)[2]	0.15 spaces per KSF	0.80 spaces per KSF	11	57
Residential	1-1.05 spaces per unit[1]	0.10 spaces per unit sf	2,403	230
Total			**3,076**	**440**

Source: City of Cambridge Zoning Ordinance Article 6.107

[1] 1.05 spaces per unit for additional units over 20

[2] Average rates for retail and restaurant have been used for planning purposes

14 Terminal Road Evaluation

Under the Existing Conditions, the majority of the Quad, particularly all sites located west of Wheeler Street, experiences a walk time from the Quad to the Alewife MBTA Station of at least 16-20 minutes (1 mile) and no shorter than 12-15 minutes (3/4 mile).

As requested in the TIS Scoping Determination, the following section discusses the team's exploration of potential additional options for connectivity in the area, specifically connections to Terminal Road (between Wheeler Street and Alewife Brook Parkway), which could reduce walking and biking times and provide quicker connections to existing retail and services along Alewife Brook Parkway.

While the Proponent does not control the parcels comprising the Terminal Road connection, this evaluation can serve to support future opportunities and strategies to guide area planning.

The Alewife District Plan includes visual references to an east-west connection between Wheeler Street and Alewife Brook Parkway, via Terminal Road (see Exhibit 7).

Exhibit 7 - Alewife District Plan (Terminal Road Connection)

Challenges

The area being contemplated within the City's Plan for this connection is currently under the ownership of at least three separate entities, over four parcels of land. Exhibit 8 depicts approximate parcel lines based on GIS mapping.

The corridor from Terminal Street west towards Parcel 2 shows buildings, utilities, loading and parking (Exhibit 9).

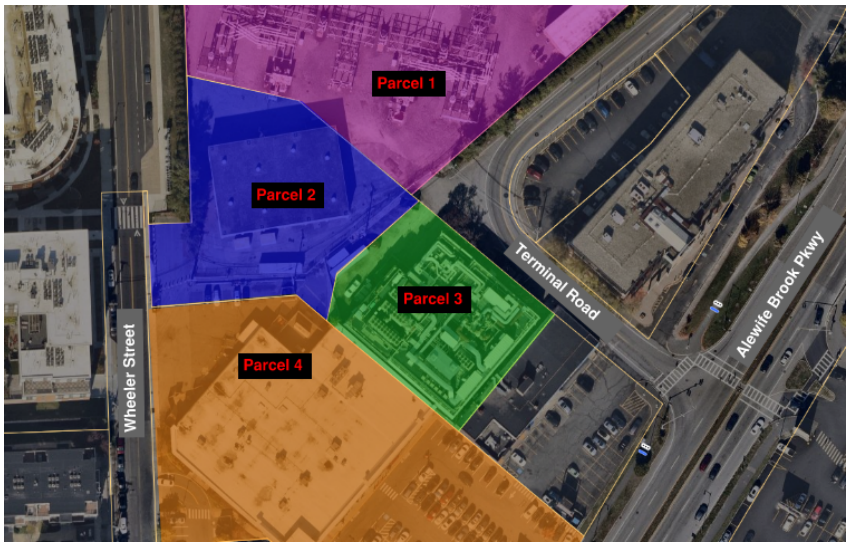

Exhibit 8 - Parcel Locations (Approximate)

Similarly, the view from the Wheeler Street side shows an active loading dock, active parking, and structure/building within parcel 2 that may include significant energy infrastructure components for the sub-station (Exhibit 10).

Exhibit 9 - View west from Terminal Rd

Exhibit 10 - View east from Wheeler Street

Benefits

Potential benefits of a Wheeler Street to Terminal Rd. Connection (vehicle access):

- Adds connectivity between the Quad, Alewife Brook Parkway, and the Shopping District - an Envision goal (Exhibit 11).
- Moulton St. to Terminal Rd. and Alewife Brook Parkway: walking would be cut down by approximately 700 feet distance or 2 minutes' time. This would result in fewer vehicle trips between these two Alewife areas.
- Without a bridge over the MBTA commuter rail tracks, the connection would cut down walk times to the Alewife MBTA Station and help boost transit mode share.
- Reduction in some vehicle traffic at the Concord Ave/Alewife Brook Parkway rotary (for trips coming from the North, which comprise about 30-40 percent of trips destined to the Quad, although not all those motorists would find a traffic travel time benefit, depending on where within the Quad they are destined)
    - It is estimated that up to half of the Project-generated trips coming from the North and destined for the Quad could choose to take the Terminal Road connection to Wheeler Street, to avoid the Alewife Brook Parkway rotary, if that connection was made available for vehicles. This detour could add approximately 185 trips in the morning peak hour and 90 trips in the evening peak hour, to Terminal Rd and Wheeler Street.
- Could reduce travel times for any Alewife MBTA Station shuttle in the outbound (to the Quad) direction (Exhibit 12).

Creating a new connection would provide an alternative route option for some. It may not translate into noticeably better traffic operations performance, but a motorist traveling that alternative route could see a noticeable travel time benefit during congested periods.

For Quad residents and employees, the connection would provide a more direct connection to the shopping plaza, particularly for those walking and biking, making the two subareas feel less disconnected from each other and creating an east-west corridor for biking/walking between Alewife Brook Parkway and Moulton Street, as southeastern parcels at the Site are redeveloped.

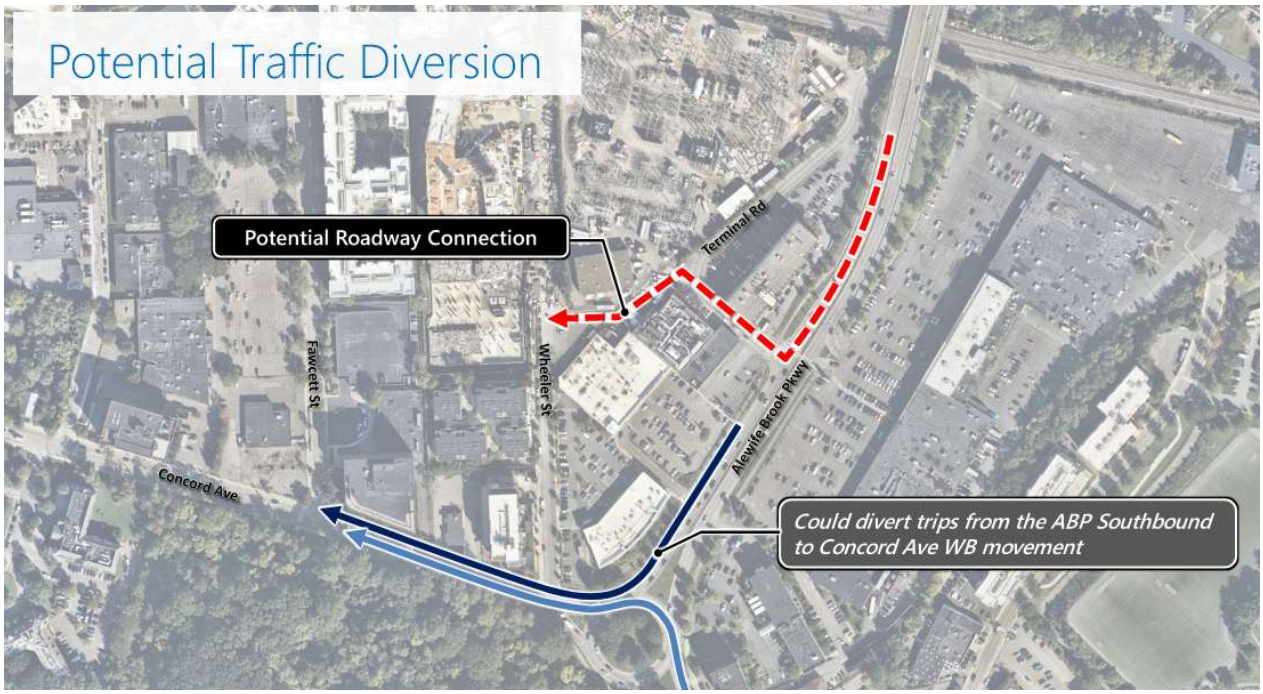

Exhibit 11 - Diversion Routing

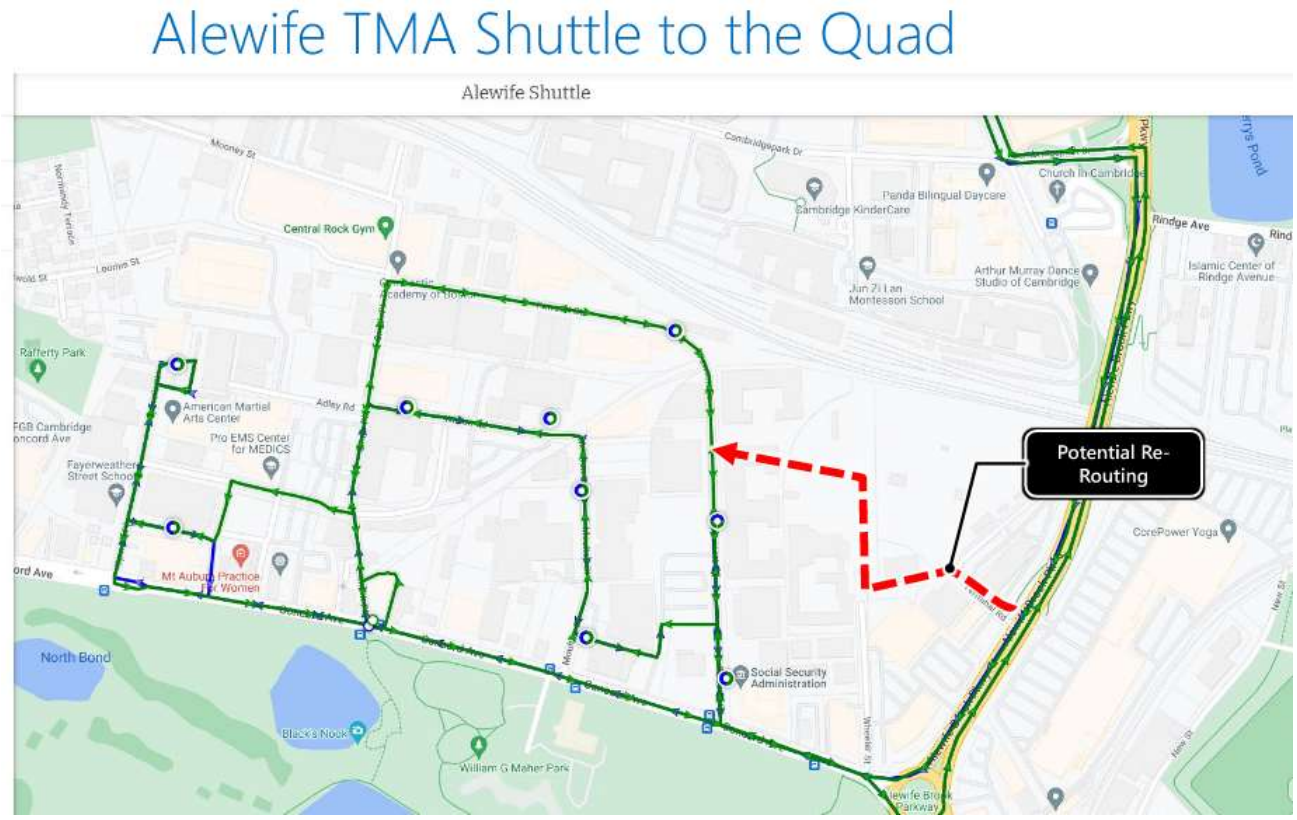

Exhibit 12 - Alewife TMA Shuttle to Quad

Options / Sketches

While the Proponent does not control the parcels needed to create a Terminal Road connection, this evaluation is intended to inform future opportunities and strategies for broader area planning. Three conceptual layouts are presented: a T-intersection, an S-curve, and a pedestrian and bike only connection.

The T-intersection and S-curve concepts both assume a 40-foot right-of-way open to vehicular traffic (Exhibit 13 and 14). The initial sketch reflects two 14-foot travel lanes, 1-foot shoulders, and 5-foot sidewalks on each side. However, this section could be reconfigured to be more pedestrian-oriented, for example, with two 11-foot travel lanes, 1-foot shoulders, and 8-foot sidewalks on each side, while maintaining the overall 40-foot right-of-way.

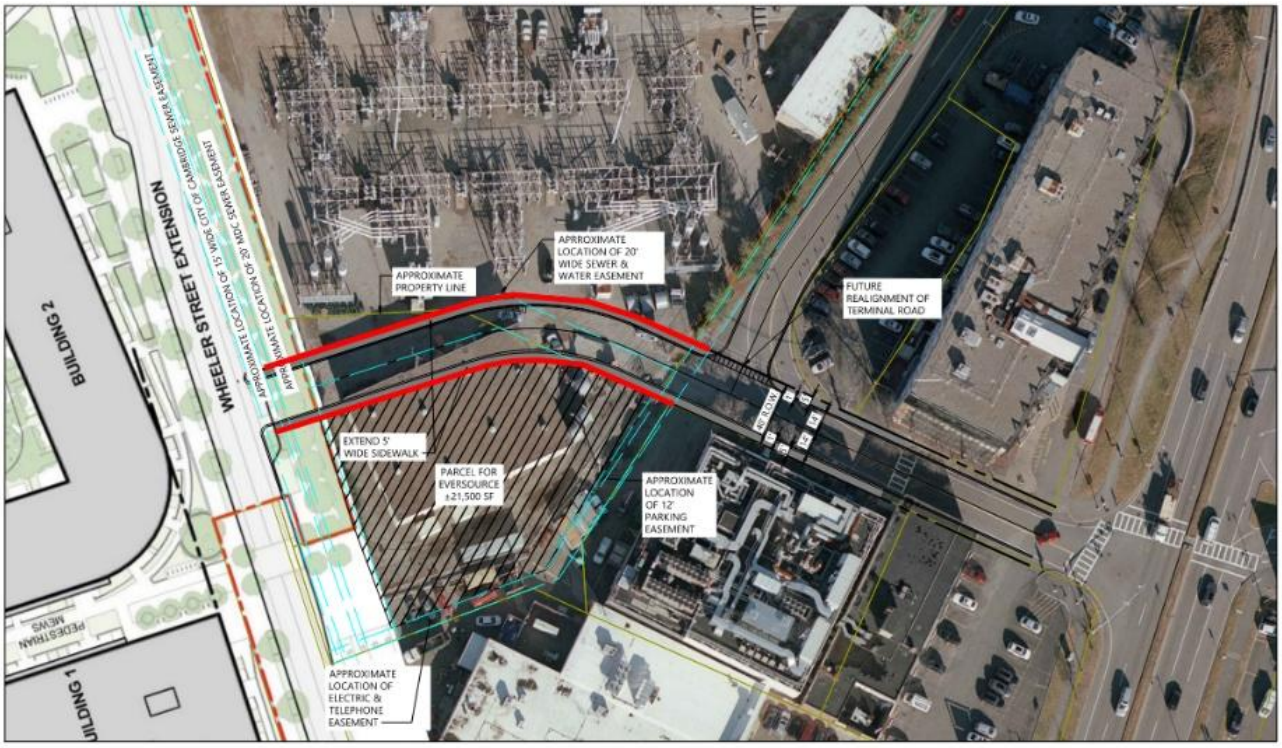

Exhibit 13 - T Intersection Layout

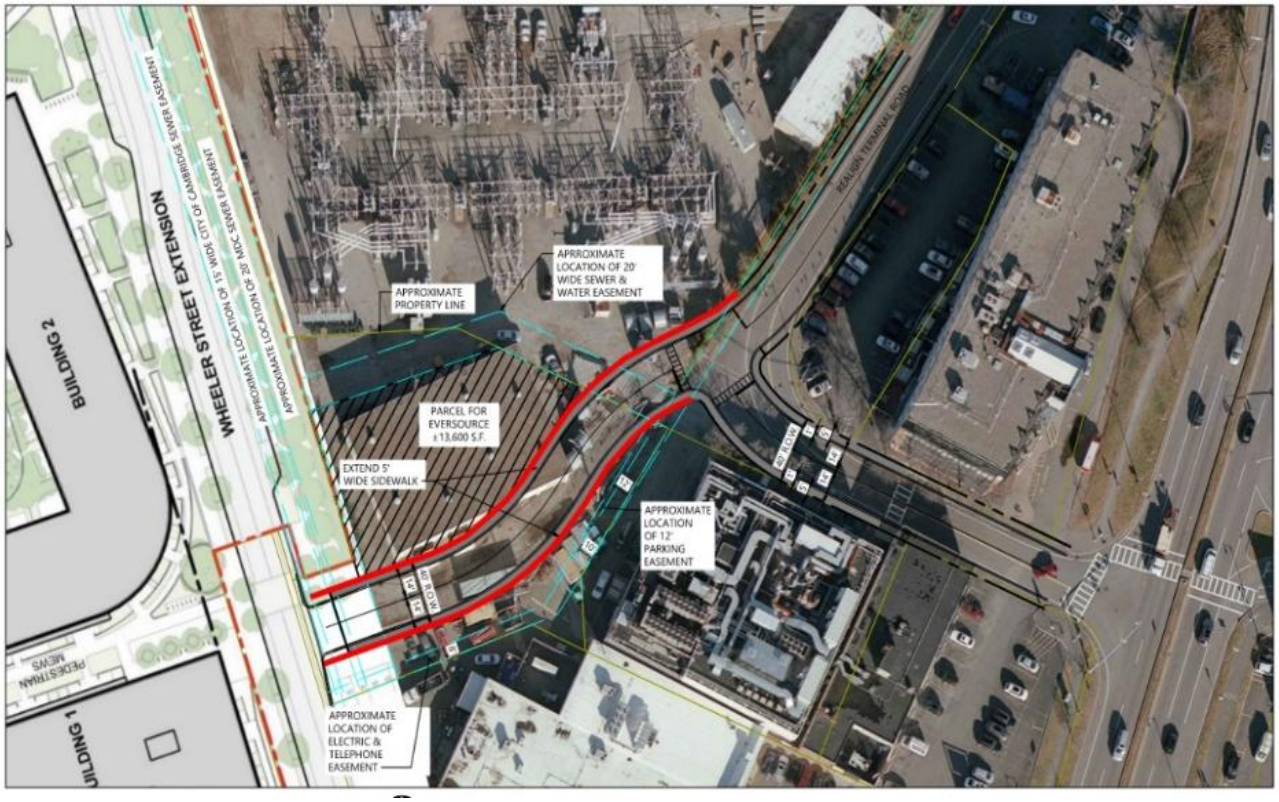

Exhibit 14 - S Curve Layout

VHB also evaluated a pedestrian and bike only connection between Terminal Road and Wheeler Street (Exhibit 15). This concept consists of an 8-foot-wide shared-use path that would tie into the existing sidewalk on Terminal Road at the eastern end and Wheeler Street at the western end. The intent of this limited connection is to provide a safer, more direct walking and biking route to Alewife Brook Pkwy and Whole Foods, reducing travel time and eliminating the need for people to cut through the Trader Joe's parking lot, as many local residents currently do, while minimizing impacts on adjacent retailers and Eversource-owned land.

Looking ahead, this path could eventually extend westward to connect with Fawcett Street. A short pedestrian segment, known as "The Mews," has already been completed, supplementing the existing vehicle connection from Wheeler Street to Fawcett Street that was achieved through prior City and community advocacy.

Exhibit 15 - Pedestrian and Bicycle Only

14.a ABP Pedestrian and Bike Connections

The Scoping Determination calls for identifying solutions to improve pedestrian and bicyclist travel along Alewife Brook Parkway between Concord Avenue and Cambridgepark Drive. Today, the corridor is served by an 8-foot sidewalk on the west side and a 10-foot sidewalk on the east side, both of which appear to function as shared-use paths for pedestrians and cyclists.

Given the amount of on-site infrastructure investment required by this development, the proponent has focused on infrastructure improvements immediately adjacent to the Project. These include the proposed bicycle and pedestrian bridge that will connect the Quad to Alewife, upgrades to internal roadways, and targeted enhancements along Concord Avenue. The proponent does not believe that it is feasible top make investments in the MassDOT owned ABP, however the proponent continues to be supportive of effort to improve pedestrian and bike access as part of a broader regional transportation planning effort.

15 Critical Sums Analysis Comparison

As requested in the Scoping Determination, the TIS is documenting how the Project's size, land uses, and trip generation compares to the Critical Sums Analysis conducted in 2019 Alewife District Plan. The Alewife Critical Sums Analysis[23] was conducted as part of Envision Cambridge by a consultant for the City of Cambridge.

As documented in the Critical Sums Analysis Report…"The City of Cambridge's Critical Sums Analysis (CSA) methodology served as the basis for this analysis. The process is based on methodology previously used by City of Cambridge for the 2001 Eastern Cambridge Planning Study (ECaPS), 2001 Citywide Rezoning, and 2005 Concord-Alewife Plan, and refined in 2011-2012 for the Kendall Square Central Square (K2C2) Study. The methodology used in these studies is based on the 1985 Highway Capacity Manual (HCM) for calculating critical lane movements (critical sums). Critical movements are the sum of the northbound left and southbound through/right compared to the southbound left and the northbound through/right. The same is done for the eastbound and westbound intersection approaches. The greater of the northbound/southbound is added to the greater of the eastbound and westbound to calculate the critical sum for the intersection. The 1985 methodology does not explicitly provide planning analysis calculations for the critical sum of rotaries. For the two rotaries in this study, the critical sum was calculated by adding the entering volumes on each approach with the conflicting volumes. The highest total of the approaches is the critical sum."

The intersections evaluated for the Alewife area plan are listed, below:

1. Alewife Brook Parkway at Concord Turnpike (Route 2)
2. Alewife Brook Parkway at Cambridgepark Drive
3. Alewife Brook Parkway at Rindge Avenue
4. Concord Avenue at Alewife Brook Parkway/Concord Avenue (rotary)
5. Concord Avenue at Fresh Pond Parkway/Concord Avenue (rotary)
6. Concord Avenue at Fawcett Street
7. Concord Avenue at Blanchard Road/Griswold Street

Table 15.a.1 summarizes the Alewife Critical Sums Analysis for the 2016 Existing Conditions and the City Approved Zoning 2030 Build Out (60%) with 40% Auto Mode Share Goal. In addition, the table quantifies the total volume and critical sum for each of the identified intersections above for the Healthpeak TIS Future-Mitigated Condition.

[23] Alewife-Critical-Sums-Analysis-Report-w-attachments.pdf

Table 15.a.1 Critical Sums Analysis Results

Intersections		Critical Sums Threshold	Envision Base Year/Existing 2016		City's Approved Zoning 2030 Build Out (60%) with 40% Auto Mode Share Goal		2029 Future-Mitigated Condition (Healthpeak TIS)	
			Total Volume	Critical Sum	Total Volume	Critical Sum	Total Volume	Critical Sum
1	Alewife Brook Parkway at Concord Turnpike (Route 2)	1,500	5,498	1,699	5,792	1,841	5,534	**1,596**
2	Alewife Brook Parkway at Cambridgepark Drive	1,500	3,844	1,267	4,360	1,416	4,015	1,454
3	Alewife Brook Parkway at Rindge Avenue	1,500	3,769	1,305	4,329	1,414	4,157	1,399
4	Concord Avenue at Alewife Brook Parkway/Concord Avenue (rotary)	1,800	3,388	2,152	4,522	2,593	4,464	**2,750**
5	Concord Avenue at Fresh Pond Parkway/Concord Avenue (rotary)	1,800	3,003	1,375	3,932	1,771	3,539	**2,837**
6	Concord Avenue at Fawcett Street	1,500	1,350	708	2,411	1,464	2,307	1,357
7	Concord Avenue at Blanchard Road/Griswold Street	1,500	1,955	1,096	2,842	**1,532**	2,576	1,416

Source: Alewife-Critical-Sums-Analysis-Report-w-attachments.pdf – Table 7

The peak hour threshold for the critical sum for typical intersections is 1,500 vehicles, and 1,800 vehicles for rotaries. Critical movement volume at an intersection is the sum of all conflicting traffic movements (vehicles per hour). Intersections with 1,500 or fewer vehicles per hour considered to operate adequately, i.e. motorists will wait no more than two light cycles to get through the intersection. When thresholds are exceeded, intersection operations start to deteriorate.

The intersections of Alewife Brook Parkway at Concord Turnpike (Route 2), Concord Avenue at Alewife Brook Parkway/Concord Avenue (rotary), and Concord Avenue at Fresh Pond Parkway/Concord Avenue (rotary) each exceed the critical sums threshold under the 2029 Future-Mitigated Condition. These intersections except for the Concord Avenue at Fresh Pond Parkway Rotary, were also exceeded under the City's Approved Zoning 2030 Build Out (60%) Critical Sums Evaluation, and two of the locations were exceeding critical sums thresholds even during the 2016 Base year/Existing count. The intersection of Concord Avenue at Blanchard Road/ Griswold Street exceeded the threshold in the City's Approved Zoning 2030 Build Out (60%), but falls below the threshold in the Project's Future Mitigated Condition.

16 Transportation Demand Management

The Proponent is committed to minimizing auto travel and encouraging alternative travel modes. The Proponent will support a program of proactive transportation demand management ("TDM") actions to reduce single occupancy vehicle ("SOV") automobile trips, support carpooling, and encourage the use of transit, biking, and walking.

The proponent will work with tenants of the new buildings to join the Alewife Transportation Management Association and implement effective TDM strategies that will be incorporated in a **Parking and Transportation Demand Management ("PTDM") Plan to be approved by the City of Cambridge PTDM Officer.**

The following are examples of TDM programs that the proponent anticipates will be part of their PTDM Plan which will be submitted to the PTDM officer for approval:

- On-Site Transportation Coordinator
- Alewife Transportation Management Association
  - Alewife TMA Shuttle Service
  - Market Alewife TMA shuttle bus schedule and services
  - Emergency Ride Home Programs
  - TMA promotional events and support service
- Carsharing (example ZipCar)
  - Reduced membership fees
  - Parking space allocation
- Parking
  - Carsharing parking spaces
  - Preferential carpool/vanpool spaces
  - Market rate parking
  - Parking supply management
  - Electric vehicle charging infrastructure
- Transit
  - MBTA pass subsidies
  - Employer pre-tax benefit programs
  - On-site marketing of MBTA services
- Bicycle
  - Bicycle parking facilities, short and long-term
  - Lockers and showers
  - "Fix-it" station
  - Bluebikes membership program
  - Bluebikes station sponsorship
  - Annual "Bike to Work" event
- Pedestrian
  - Pedestrian pathways and streetscape
  - Lighting for pedestrian pathways
  - Enhanced pedestrian connections
- Encouragement for Tenant Commuter Programs
  - Alternative Work Hours
  - Staggered Work Hours
  - Telecommuting
- Marketing and Promotion
  - New/relocating employee information packets
  - Website
  - Transportation Fairs/Events
- Lease Language
- Tenant participation in PTDM monitoring surveys
- TDM employee programs through tenants
- Large tenant participation in TMAs
- Tenant job notices provided to the Cambridge Office of Workforce Development

17 Consistency with Other Area Plans

The following site planning discussions regarding the Project's consistency with Cambridge Planning Initiatives were requested as part of the TIS scope dated December 6, 2024.

2019 Alewife District Plan (ADP)

Exhibit 16 - Alewife District Plan - Street Types 2019

Quadrangle Street Network + Cross Sections

The Project's proposed street network, circulation and access plan aligns with the City's 2019 Alewife District Plan[24] as well as the 2023 Alewife Design Guidelines[25] and accompanying street hierarchy sections[26] (Exhibit 16 and 17).

The conceptual street plan and recommended Quad street grid reduces the length of street blocks, creates a more urban and people-oriented environment, and improves circulation for all modes.

The Project satisfies the city recommended proposed street grid, street types, and preferred bicycle facilities. Preliminary roadway sections for east street are included in the Appendix M.

[24] 20191022_Alewife.pdf

[25] https://www.cambridgema.gov/-/media/Images/CDD/Planning/alewifeplanningandzoning/alewifedesignguidelines_20230515_reduced.pdf

[26] https://www.cambridgema.gov/-/media/Images/CDD/Planning/alewifeplanningandzoning/NewStreetCenterlines.pdf

The plan improves the bicycle and pedestrian network by adding sidewalks, high visibility crosswalks, and bicycle facilities to new and improved streets.

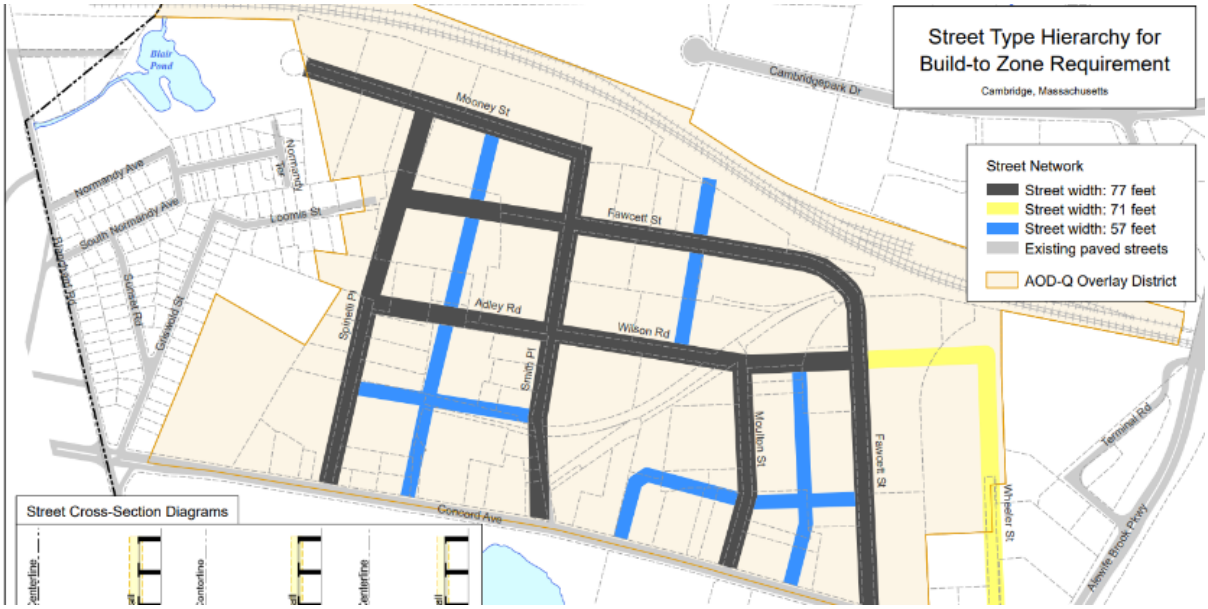

Exhibit 17 – Alewife Street Hierarchy (2023)

The following describes the cross sections of each segment of street as proposed by the Project, understanding that the details of the roadway geometry and cross-sectional dimensions will be discussed with city staff, and finalized in a 40-scale roadway plan set that will be developed with the Special Permit process for the proposed masterplan.

- ***Fawcett Street (between Concord Avenue to Wheeler Street Extension / Wilson Road Extension)*** – The proposed design accommodates the city's recommended Street Type A with a width of 77 feet. The proposed layout for Fawcett Street provides for 10-ft sidewalks, 5-ft landscape/furnishing zones, 5-ft separated bike lanes with additional 2 to 3-ft buffers, and 11-ft travel lanes with pockets for 8-ft on-street parking in certain locations. The design follows the recommended city section type, where the proponent controls the street frontage.
- ***Fawcett Street (between Wheeler Street Extension / Wilson Road Extension to Bridge Crossing)*** – The proposed design accommodates the city's recommended Street Type A, on the southwest side only where the Proponent controls the frontage. The proposed layout for Fawcett Street on the southwest side provides a 10-ft sidewalk, 5-ft landscape/furnishing zone, 5-ft separated bike lane with additional 4-ft buffer, and 11-ft travel lane. Pockets for 8-ft on-street parking are also provided in certain locations. The northeast side is proposed with an 8-ft sidewalk, 5-ft street-level bike lane with additional 3-ft buffer, and 11-ft travel lane. The design generally follows the recommended city section type where the proponent controls the street frontage.
- ***Fawcett Street Extension (between Smith Place and New Mooney Street)*** – The proposed cross section accommodates the city recommended Street Type A with a width of 77 feet. The proposed layout for Fawcett Street Extension provides for 10-ft sidewalks, 5-ft landscape/furnishing zones, 5-ft separated bike lanes with additional buffers (4 ft adjacent

to on-street parking and 3 ft in other sections), and 11-ft travel lanes with pockets for 8-ft on-street parking in certain locations.

- ***New Main Street (between Concord Avenue and Wilson Road Extension) –*** New Main Street has been recommended by the City as a Street Type C with a target right-of-way width of 57 feet; the current design is wider at approximately 70 feet, closer to the City's Type B dimension. The proposed layout treats New Main Street as a shared street, with 10-ft sidewalks, 5- to 14-ft landscape/furnishing zones, and a 20-ft two-way travel way, supplemented by 7-ft curbside pockets for temporary parking, short-term loading (e.g. rideshare and delivery services), and shuttle bus stops. Cyclists will share the travel way with vehicles. Although, New Main Street is not intended to function as a primary vehicular access route – since it does not provide direct access to garages or loading docks – it is envisioned as an active, retail-oriented street. Ground-floor neighborhood and retail uses will front the corridor, benefiting from a lively public realm supported by vehicular circulation at low speeds. New Main Street is designed to prioritize walkability and a people-centered environment. Wide sidewalks, street trees, outdoor seating, and comfortable gathering areas will encourage social activity and support local businesses. Activation may include outdoor dining, live music, and pop-up events, supported by appropriate lighting and streetscape amenities. As currently contemplated, New Main Street would allow limited vehicular access at Concord Avenue in the form of right-in/right-out movements only. Left turns from eastbound Concord Avenue onto New Main Street are not proposed, to avoid introducing additional queueing on Concord Avenue. Final design details will be developed in coordination with the DOT as part of the 40-scale roadway plans.

- ***Moulton Street (between Concord Ave and Wilson Road)*** - Recommended by the city as Street Type A with a width of 77 feet, where the current design is generally accommodating. The proposed roadway is narrower on the northern portion of Moulton Street due to the proponent's limited ownership on the west side of Moulton Street. The proposed layout for Moulton Street provides 10-ft sidewalks, 5-ft landscape zones, 5-ft separated bike lanes with additional 3 to 4-ft buffers, and 11-ft travel lanes with pockets for 8-ft on-street parking in certain locations. The roadway widens to a width of 79 feet approaching Concord Avenue where a turn lane is provided. The design follows the recommended city section type where the proponent controls the street frontage along the east side of Moulton Street. On the west side of Moulton Street however, the city dimension is only proposed between Concord Ave and the pedestrian way.

- ***Smith Place (between Concord Ave and Fawcett Street)*** - Recommended by the city as Street Type A with a width of 77 feet, where the current design varies due to the proponent's limited ownership on both sides of Smith Place. The proposed layout for Smith Place provides 10-ft sidewalks, 5-ft landscape zones, 5-ft separated bike lanes with additional 3 to 4-ft buffers (where possible) and 11-ft travel lanes with pockets for 8-ft on-street parking in certain locations. Opportunities for on-street parking are limited on Smith Place. A segment of Smith Place (closer to Concord Ave) is proposing a 14-ft multiuse path in lieu of sidewalks and separated bike lanes.

- ***Smith Place Extension (between Fawcett Street and New Mooney Street)*** - The proposed cross section accommodates the city recommended Street Type A with a width of 77 feet. The proposed layout provides for 10-ft sidewalks, 5-ft landscape/furnishing zones, 5-ft separated bike lanes with additional buffers (4 ft adjacent to on-street parking and 3 ft

otherwise), and 11-ft travel lanes with pockets for 8-ft wide on-street parking in certain locations.

- ***Wilson Road Extension (between Moulton Street and Fawcett Street)*** - The proposed cross section accommodates the city recommended Street Type A with a width of 77 feet. The proposed layout provides for 10-ft sidewalks, 5-ft landscape/furnishing zones, 5-ft separated bike lanes with additional buffers (4 ft adjacent to on-street parking and 3 ft otherwise), and 11-ft travel lanes with pockets for 8-ft wide on-street parking on the north side. Wilson Road Extension at the intersection with New Main Street is envisioned as a raised intersection to provide for a more defined/visible pedestrian space.
- ***Adley Road (between parking lot and Smith Place)*** - The proposed cross section accommodates the city recommended Street Type A with a width of 77 feet. The proposed layout provides for 10-ft sidewalks, 5-ft landscape/furnishing zones, 5-ft separated bike lanes with additional buffers (4 ft adjacent to on-street parking and 3 ft otherwise), and 11-ft travel lanes with pockets for 8-ft wide on-street parking on the north side.
- ***New Mooney Street (between Fawcett Street Extension and Smith Place Extension) –*** The original layout for Mooney Street contemplates a city recommended Street Type A with a width of 77 feet. The Proponent intends to pursue an acquisition process to relocate Mooney Street north by approximately 200 ft from its current location to align with the Masterplan Proposal. Benefits of the Mooney Street relocation (in addition to favorable building footprints) include a significant capture of contiguous open space into a 'Mooney Park'. This newly created publicly beneficial open space will be a lasting, inclusive, and adaptable landscape responsive to evolving campus needs and rooted in environmental management. As currently designed, New Mooney Street includes a 10-ft sidewalk, 5-ft landscape/furnishing/buffer zone and 8-ft on-street parking zone on the south side. Two 11-ft travel lanes are also proposed. New Mooney Street will be reimagined with a city-envisioned multi-use path on its north side. This path plays a key role in the long-term vision to connect the Highland neighborhood to the Eversource power station.

The Project aims to meet the recommended cross-section dimensions from the city, where feasible and practicable. The plan currently includes some areas that would require additional coordination with the City and other landowners to fulfill the desired cross section, as noted in the city's recommended street typology.

Mobility Recommendations

The mobility recommendations of the 2019 Alewife District Plan are as follows:

Table 17.b.1 2019 Alewife District Plan – Mobility Recommendations Alignment

Recommendations	Proposed by the Project?
Implement low maximum parking ratios, rather than minimums, across the entire district in order to discourage driving.	Yes, shared parking analysis conducted in Section 10
Encourage shared parking garages in new development, particularly in the Shopping Center subdistrict, to consolidate parking and eliminate surface parking lots.	Yes, shared parking analysis conducted in Section 10

Require all new development to have an individual mode share target with the automobile mode share equal to or less than the district-wide automobile mode share target.	Yes, individual mode share targets will be established as part of the PTDM process
Require new commercial building owners to provide enhanced PTDM, including charging market-rate parking to end users.	Yes, see PTDM measures in Section 16.
Encourage conversion to electric vehicles through investment in public and private electric vehicle infrastructure as a means of reducing greenhouse gas emissions.	Yes, see PTDM measures in Section 16.

Vision and Goals

The following describes how the Project is generally consistent with the vision and goals of the 2019 Alewife District Plan. The proposed Site plan and access and circulation plans presented in Figures D.a through E.e illustrate planned bicycle and pedestrian pathways through the Site which connect the existing Fresh Pond Reservation series of trails and recreation space, including the Fresh Pond Perimeter Road which is a multi-use trail, with the Quad and extending the connection opportunities even further north with the proposed bicycle/pedestrian bridge to less non-contiguous connections to the Triangle and access toward the Minuteman Commuter Bikeway, Alewife Linear Path and Fitchburg Cut-off which all intersect just north of Alewife MBTA station. The Alewife District Plan strategies related to the transportation plan are listed in Table 17.d.2.

Table 17.d.2 Alewife District Plan Strategies Alignment

Strategies	Strategy Description	Strategic Goal Achieved by Proposed Project?
(1) Enhancing all modes of transportation + reducing dependency on auto travel	Enhanced transportation demand management (TDM)	Yes, will commit to a robust PTDM plan
	New bicycle + pedestrian infrastructure	Yes, proposed bicycle/pedestrian bridge and construction of complete streets throughout the Quad and along Concord Avenue.
	Parking maximums	Yes, proposing appropriate amount of parking with a shared parking strategy to support activation of the Quad while balancing with reliance on alternative modes of travel.
(2) Design the public right-of-way to support the desired character of the district by creating lively and varied street types that improve the experience of the street.	Including widths of vehicle lanes; the widths of the sidewalk; and the presence of bicycle facilities, street trees + street furniture.	Yes, right of ways are designed per City recommended sections and typologies

(3) Provision of new connections	The new roadway connections are intended to provide better access within the subdistrict, create a finer-grained street grid that better distributes traffic, and reduce the length of blocks to make walking more convenient and appealing.	Yes, the Project is including new roadway connections and pedestrians/ bicycle connections.

Source: Alewife District Plan, Fall 2019

2019 Envision Cambridge

The following describes how the Project is generally consistent with the goals of Envision Cambridge[27]. The Envision Cambridge goals related to the transportation plan are listed in Table 17.d.3 below.

Table 17.d.3 Envision Cambridge Goals Alignment

Goals	Strategic Goal Achieved by Proposed Project?
(1) **Climate Action** - Through a broad-based reduction in energy consumption and investment in sustainable energy, Cambridge can set its course to achieve overall carbon neutrality by midcentury.	Yes – (1) Proponent is committed to providing a suitable and appropriate amount of parking to support use of alternative modes of travel via a shared parking analysis. (2) proposed bicycle/pedestrian bridge (3) New bicycle + pedestrian infrastructure (4) Enhanced transportation demand management (TDM)
(6) **Environmental Justice** - The benefits of a healthy environment should be shared by everyone in Cambridge, including all residents, workers, students, and visitors, regardless of their background and identity.	Yes – (1) Proponent is committed to working with the City to provide a suitable and appropriate amount of parking to support use of alternative modes of travel via a shared parking analysis. (2) proposed bicycle/pedestrian bridge (3) New bicycle + pedestrian infrastructure (4) Enhanced transportation demand management (TDM)

Envision Cambridge Final Plan

[27] Envision Cambridge Final Plan

2015 Cambridge Transit Strategic Plan

The following describes how the Project is generally consistent with the goals of the 2015 Cambridge Transit Strategic Plan[28]. The Cambridge Transit Strategic Plan goals related to the transportation plan are listed in Table 17.d.4 below.

Table 17.d.4 Cambridge Transit Strategic Plan Goals Alignment

Goals	Objectives	Strategic Goal Achieved by Proposed Project?
(1) Maximize Transit's Ability to Serve All Trips	Objective #5: Prioritize transit projects that support transit-oriented development	Yes, via proposed bicycle/pedestrian bridge site employees and residents will have access to the MBTA Alewife station. Improvements to MBTA bus stops along Concord Avenue and TMA shuttle bus stops within the Quad. Proponent will advocate for a commuter rail station at Alewife.
(2) Increase and Prioritize Transit Funding	Objective #4: Increase developer contributions for improving transit	Yes, via proposed bicycle/pedestrian bridge site employees and residents will have access to the MBTA Alewife station. Improvements to MBTA bus stops along Concord Avenue and TMA shuttle bus stops within the Quad. Proponent will advocate for a commuter rail station at Alewife.
(3) Increase Efficiency and Reliability of Transit Services	Objection #3: Incorporate transit improvements into all City projects when reconstructing or redesigning roadways, sidewalks, and intersections	Yes, the Proponent will work with the MBTA and not preclude any future MBTA stops. Proponent will advocate for a commuter rail station at Alewife.
	Objective #4: Prioritize transit and other sustainable modes over driving when allocating public space and signal time on roadways, leading to greater transit efficiency	Yes, Concord Avenue to include signal optimization for better efficiency for all road users; updates to striping and signage (including bus stops). Improvements to MBTA bus stops along Concord Avenue and TMA shuttle bus stops within the Quad. Proponent will advocate for a commuter rail station at Alewife.
	Objective #5: Coordinate with the MBTA and private shuttles to advocate for increased bus and commuter rail efficiency and reliability	Yes, the Proponent will work with the MBTA and not preclude any future MBTA stops. Improvements to MBTA bus stops along Concord Avenue and TMA shuttle bus stops within the Quad.
(5) Improve Usability, Accessibility, and Safety	Objective #3: Improve and encourage access to transit by other sustainable modes	Yes, via proposed bicycle/pedestrian bridge.

2015 Transit Strategic Plan

[28] 2015 Transit Strategic Plan

2020 Cambridge Bicycle Plan

The following describes how the Project is generally consistent with the goals of the 2020 Cambridge Bicycle Plan[29]. The Cambridge Bicycle Plan goals are as follows:

1. Make a shift in bicycling as a sustainable transportation mode
2. Create a transportation system that is safe for and accessible to users of all ages, abilities, and identities
3. Innovate and be an early adopter of best practices in bicycle infrastructure

The Cambridge Bicycle Plan targets that are related to the transportation plan are listed in Table 17.d.5 below.

Table 17.d.5 Cambridge Bicycle Plan Targets Alignment

Targets	Strategic Goal Achieved by Proposed Project?
(A) By 2020, 10% of all trips in Cambridge will be made by bicycle.	Yes – In coordination with the City's DOT, the Project is assuming bicycle mode shares of 3.8% for residents, 6.4% for retail/neighborhood users and 6.3% for technical office/office users
(B) By 2030, 20% of all trips in Cambridge will be made by bicycle	
(C) By 2020, the percentage of children walking and bicycling to school will increase 20% over 2015 numbers	
(D) Crash rates will continue to decrease with a goal of zero fatalities or serious injuries by 2020	Yes – Bicycle Network visions the following: (1) greater separation for bicyclists along Concord Ave (2) "Rail Path" running diagonally through the Quadrangle, (3) multiuse path adjacent to the railroad tracks, (4) complete streets within the Quad, and (5) the bike/ped bridge – all of which are currently being included in the proposed design
(E) All streets will be bicycle friendly	
(F) New facilities are prioritized based on the Bicycle Network Vision[30]	

[29] 2020 Bike Plan - Cambridge Massachusetts

[30] Bicycle Network Vision Map

2018 Cambridge Vision Zero

On March 21, 2016, the Cambridge City Council unanimously adopted Vision Zero, and on February 8, 2018 the City released the Vision Zero Action Plan[31] and announced the creation of 20 MPH Safety Zones in 5 major squares. The following describes how the Project is generally consistent with the action plan initiatives of the Vision Zero Action Plan. The Vision Zero Action Plan Initiatives related to the transportation plan are listed in Table 17.d.6 below.

Table 17.d.6 Vision Zero Action Plan Initiatives Alignment

Initiatives	Action Items	Strategic Goal Achieved by Proposed Project?
(A) **Design and Operate Safe Streets:** The City will design and operate our streets to ensure that people of all ages and abilities can walk, bike, use transit, and drive safely.	Grow network of Separated Bike Lanes	Yes, Concord Ave corridor study seeks opportunities to (1) better organize turning movements, (2) reduce vehicle queuing, and (3) improve pedestrian and bicycle movements and crossings for the Concord Avenue corridor (4) multiuse path adjacent to the railroad tracks, (5) complete streets within the Quad, and (6) the bike/ped bridge – all of which are currently being included in the proposed design
	Enhance Intersection Safety	
	Traffic Calming	
	Change Infrastructure, Roadway Layout, And Curb Usage To Prevent Stopping And Parking In Bike Lanes, Crosswalks, And Pedestrian Ramps	
	Safe Routes to Transit	Yes, via proposed bicycle/pedestrian bridge. Complete streets within the Quad, improved MBTA bus stops on Concord Ave.

VisionZero_ActionPlan.pdf

[31] VisionZero_ActionPlan.pdf

18 Transportation Mitigation

The Project has an estimated 107 exceedances out of 363 total data entries:

- 3 exceedances pertain to Project trip generation, see Table Criteria A-1.
- 20 exceedances pertain to vehicle Level of Service ("LOS"), see Table Criteria B-2.
- 20 pertain to traffic on residential streets, see Table Criteria C-2.
- 13 pertain to vehicular queues, see Table Criteria D-2.
- 51 pertain to pedestrian LOS, see Table Criteria E-1.

The Proponent is committed to responsibly managing vehicular impacts, while supporting bigger neighborhood and city safety goals.

The transportation mitigation strategy focuses on responsibly managing vehicular impacts while delivering substantial, long-term improvements for walking, biking, and transit in and around the Alewife Quadrangle. The Proponent's commitments prioritize safer, more direct multimodal connections, especially to Alewife Station and Concord Avenue, and invest in a complete streets network within the Quad.

Key transportation mitigation commitments include:

New bicycle/pedestrian bridge

- Design and support construction of a new bike/ped bridge over the MBTA Commuter Rail, connecting the Quadrangle to the Triangle. This will help to close a critical gap between the Minuteman Commuter Bikeway, Fitchburg Cutoff, Alewife Linear Path, and the Fresh Pond Reservation network. The bridge will also shorten and improve access to the MBTA Red Line Alewife Station and encourage greater use of active modes and transit.

Internal complete streets and network build-out

- Reconstruct Fawcett Street, Moulton Street, Smith Place, Wilson Road, and construct New Mooney Street and New Main Street using City preferred cross sections, including space for pedestrians, cyclists, and street trees where the Proponent controls adjacent property.
- Build Smith Place Extension and Fawcett Street Extension to complete access and circulation for pedestrians, bicyclists, and vehicles.
- Install separated bicycle facilities on all reconstructed or newly constructed streets in line with the Citywide Bike Plan.
- Provide clear, safe crosswalks (including mid-block where appropriate), continuous sidewalks, high-visibility crossings, and aligned multi-use paths that connect to existing bike facilities and crosswalks on major streets and parkways.
- Use signage, wayfinding, and curb radii design to define preferred freight routes and discourage trucks on local streets not suited for heavy vehicles.

Concord Avenue and key intersection improvements

- Realign and fully signalize the Concord Avenue/Smith Place intersection, enabled by acquisition of the Baystate Pool property.
- Add dedicated left- and right turn lanes on Smith Place and Fawcett Street approaches to Concord Avenue, and provide limited turn lanes from Concord Avenue into the site.
- Optimize signal timing at Concord Avenue intersections (including Blanchard Street, Moulton Street, and Fawcett Street) to reduce delays and improve safety.
- Upgrade signal equipment at Moulton Street intersection to better improve signal efficiency.
- Upgrade MBTA bus stops with amenities such as benches and shelters.
- Set back new buildings along Concord Avenue to accommodate wider sidewalks, street trees, and safer bike facilities (cycle tracks with buffers).

Wayfinding, bike infrastructure, and Bluebikes

- Install a coordinated wayfinding signage system with walk/bike times to key destinations, Bluebikes stations, and centralized parking.
- Align on-street bike lanes and multi-use paths to plug directly into existing and future bicycle networks.
- Add up to five Bluebikes stations within a 2.5-minute walk of buildings, in step with development phasing. Exact location of stations will be coordinated with the City.
- Expand support for active transportation through discounted Bluebikes memberships, carpool incentives, and high-quality long-term bicycle parking.

Transit and TDM measures

- Join the Alewife TMA and its shuttle program.
- Advocate for continued MBTA Red Line improvements.
- Advocate for commuter rail station at Alewife.
- Prepare and implement a Parking and Transportation Demand Management (PTDM) plan to reduce single-occupancy vehicle trips.

Terminal Road / Wheeler Street connection concept

- Advocate for advance study of a Terminal Road connection.
- Complete an east-west pedestrian connection between Wheeler Street and Fawcett Street, north of P4 garage, building on the already completed “Mews” pedestrian segment.

Together, these measures are designed to create a safer, more predictable, and more comfortable multimodal network for residents, employees, and visitors, while responsibly managing vehicular traffic generated by the Project.

Table 18.a.1 provides a listing of all Planning Board Special Permit Exceedances. The Project exceeds 107 out of 363 possible data entries. The table indicates how transportation mitigation measures will or cannot mitigate the reason for the exceedance.

Table 18.a.1 Exceedance Mitigation Summary Table

#	Location		Reason for Exceedance	Mitigation
	Criterion A - Project Vehicle Trip Generation			
1	Project	Vehicle Trip Generation - Daily	Project to generate more than 2,000 vehicle trips	Concord Ave Corridor Improvements and signal optimization discussed above. In addition, ambitious TDM commitments as detailed in Section 15.
2	Project	Vehicle Trip Generation - Morning	Project to generate more than 240 vehicle trips	
3	Project	Vehicle Trip Generation - Evening	Project to generate more than 240 vehicle trips	
	Criterion B - Vehicle LOS			
4	Concord Avenue at Blanchard Road/ Griswold Street	Level of Service - Morning	Build Condition to increase traffic by more than 5%	Concord Ave Corridor Improvements.
5		Level of Service - Evening	Build Condition to increase traffic by more than 5%	
6	Concord Ave at Smith Place	Level of Service – Morning	Build Condition to change from LOS A to E	
7		Level of Service - Evening	Build Condition to change from LOS A to E	
8	Concord Ave at Moulton Street	Level of Service - Evening	Build Condition to change from LOS B to C	
9	Concord Avenue at Fawcett Street	Level of Service - Morning	Build Condition to change from LOS B to F	
10		Level of Service - Evening	Build Condition to change from LOS B to F	
11	Concord Ave at Alewife Brook Parkway	Level of Service - Morning	Build Condition to increase traffic by more than 5%	Ambitious TDM commitments as detailed in Section 16.
12		Level of Service - Evening	Build Condition to increase traffic by more than 5%	
13	Concord Ave at Fresh Pond Parkway	Level of Service - Morning	Build Condition to increase traffic by more than 5%	
14		Level of Service - Evening	Build Condition to increase traffic by more than 5%	
15	Concord Avenue at Huron Avenue	Level of Service - Evening	Build Condition to change from LOS D to E	
16	Alewife Brook Parkway at Terminal Road/ Fresh Pond Mall	Level of Service - Morning	Build Condition to change from LOS B to E	
17	Alewife Brook Parkway at Rindge Avenue	Level of Service - Morning	Build Condition to increase traffic by more than 5%	Signal optimization discussed above. In addition, ambitious TDM commitments as detailed in Section 16.
18		Level of Service - Evening	Build Condition to increase traffic by more than 5%	
19	Alewife Brook Parkway at Cambridgepark Drive	Level of Service - Morning	Build Condition to change from LOS D to E	
20		Level of Service - Evening	Build Condition to increase traffic by more than 5%	
21	Alewife Brook Parkway at Concord Turnpike (Route	Level of Service - Morning	Build Condition to increase traffic by more than 7%	

Table 18.a.1 Exceedance Mitigation Summary Table

#	Location		Reason for Exceedance	Mitigation
22	2)	Level of Service - Evening	Build Condition to increase traffic by more than 7%	
23	Massachusetts Avenue at Alewife Brook Parkway	Level of Service - Morning	Build Condition to increase traffic by more than 5%	
	Criterion C - Traffic on Residential Streets			
24	Concord Avenue - Hamilton Road to Blanchard Road/Griswold Street	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 40 VPH	Concord Ave Corridor Improvements, ambitious TDM commitments as detailed in Section 16.
25		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 40 VPH	
26	Concord Avenue - Fayerweather Street to Walden Street	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 40 VPH	
27		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 40 VPH	
28	Concord Avenue - Walden Street to Appleton Street	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 40 VPH	
29		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 40 VPH	
30	Concord Avenue - Chauncy Street to Garden Street	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 60 VPH	
31		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 60 VPH	
32	Blanchard Road - Merrill Avenue to Concord Avenue	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 40 VPH	
33		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 40 VPH	
34	Rindge Avenue - Alewife Brook Parkway to Clifton Street	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 60 VPH	Signal optimization discussed above. In addition, ambitious TDM commitments as detailed in Section 15.
35		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 60 VPH	
36	Rindge Avenue - Clay Street to Sherman Street	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 40 VPH	
37		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 40 VPH	
38	Rindge Avenue - Sherman Street to Reed Street/ Sargent Street	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 40 VPH	
39		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 40 VPH	
40	Fresh Pond Parkway - Larch Road to Huron Avenue	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 40 VPH	
41		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 40 VPH	
42	Fresh Pond Parkway - Huron Avenue to Fresh Pond Lane	Residential Street Traffic - Morning	Build Condition to increase traffic by more than 40 VPH	
43		Residential Street Traffic - Evening	Build Condition to increase traffic by more than 40 VPH	

Table 18.a.1 Exceedance Mitigation Summary Table

#	Location		Reason for Exceedance	Mitigation
	Criterion D - Lane Queue			
44	Concord Avenue at Blanchard Road/Griswold Street	Concord Avenue WB L - Evening	Build Condition queue to increase to more than 15 vehicles	Concord Ave Corridor Improvements, ambitious TDM commitments as detailed in Section 15.
45		Concord Avenue WB R - Evening	Build Condition queue to increase to more than 15 vehicles	
46		Blanchard Road SEB L/T/R - Morning	Build Condition to increase queue by more than 6 vehicles	
47	Concord Avenue at Moulton Street	Concord Avenue EB L/T - Morning	Build Condition queue to increase to more than 15 vehicles	
48		Concord Avenue EB T/R - Morning	Build Condition queue to increase to more than 15 vehicles	
49	Concord Avenue at Fawcett Street	Concord Avenue WB T/R - Morning	Build Condition queue to increase to more than 15 vehicles	
50		Concord Avenue SB L/R - Evening	Build Condition queue to increase to more than 15 vehicles	
51	Alewife Brook Parkway at Terminal Road / Fresh Pond Mall	Alewife Brook Parkway NB T - Morning	Build Condition queue to increase to more than 15 vehicles	
52		Alewife Brook Parkway NB T - Evening	Build Condition queue to increase to more than 15 vehicles	
53	Alewife Brook Parkway at Rindge Avenue	Alewife Brook Parkway NB T/R - Morning	Build Condition to increase queue by more than 6 vehicles	Signal optimization discussed above. In addition, ambitious TDM commitments as detailed in Section 15.
54		Alewife Brook Parkway NB T/R - Evening	Build Condition to increase queue by more than 6 vehicles	
55	Alewife Brook Parkway at Cambridgepark Drive	Alewife Brook Parkway SB T - Morning	Build Condition to increase queue by more than 6 vehicles	
56		Alewife Brook Parkway SB T - Evening	Build Condition to increase queue by more than 6 vehicles	
	Criterion E - Pedestrian Delay			
57	Concord Avenue at Blanchard Road/Griswold Street	East Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	Ambitious site planning solutions proposed for the site as discussed above including proposed new bicycle/pedestrian bridge.
58		West Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
59		North Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
60		South Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
61		East Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
62		West Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
63		North Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
64		South Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	

Table 18.a.1 Exceedance Mitigation Summary Table

#	Location		Reason for Exceedance	Mitigation
65	Concord Avenue at Spinelli Place	East Crosswalk - Morning	Build Condition to change from PLOS D to F	
66		East Crosswalk - Evening	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
67	Concord Avenue at Smith Place	North Crosswalk - Morning	Build Condition to change from PLOS A to D	
68		North Crosswalk - Evening	Build Condition to change from PLOS A to D	
69	Concord Avenue at Wheeler Street	West Crosswalk - Morning	Existing PLOS = E and Build PLOS = F. Threshold is PLOS D with the Project.	
70		West Crosswalk - Evening	Existing PLOS = E and Build PLOS = F. Threshold is PLOS D with the Project.	
71	Fresh Pond Parkway at Huron Avenue	East Crosswalk - Morning	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
72		West Crosswalk - Morning	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
73		North Crosswalk - Morning	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
74		South Crosswalk - Morning	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
75		East Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
76		West Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
77		North Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
78		South Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	Ambitious site planning solutions proposed for the site as discussed above including proposed new bicycle/pedestrian bridge.
79	Alewife Brook Parkway at Terminal Road/Fresh Pond Mall	West Crosswalk - Morning	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
80		North Crosswalk - Morning	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
81		East Crosswalk - Evening	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
82		West Crosswalk - Evening	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
83		North Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
84	Alewife Brook Parkway at Rindge Avenue	East Crosswalk - Morning	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
85		South Crosswalk - Morning	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
86		East Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
87		South Crosswalk - Evening	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	

Table 18.a.1 Exceedance Mitigation Summary Table

#	Location		Reason for Exceedance	Mitigation
88	Alewife Brook Parkway at Concord Turnpike (Route 2)	East Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	Ambitious site planning solutions proposed for the site as discussed above including proposed new bicycle/pedestrian bridge.
89		East Crosswalk - Evening	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
90	Massachusetts Avenue at Alewife Brook Parkway	East Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
91		West Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
92		North Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
93		South Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
94		East Crosswalk - Evening	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
95		West Crosswalk - Evening	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
96		North Crosswalk - Evening	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
97		South Crosswalk - Evening	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
98	Garden Street at Sherman Street at Huron Avenue	East Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
99		West Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
100		North Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
101		Northwest Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
102		South Crosswalk - Morning	Existing and Build PLOS = F. Threshold is PLOS D with the Project.	
103		East Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
104		West Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
105		North Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
106		Northwest Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	
107		South Crosswalk - Evening	Existing and Build PLOS = E. Threshold is PLOS D with the Project.	

Planning Board Special Permit Criteria

Criterion A – Project Vehicle Trip Generation

Table A-1 presents the Project vehicle trip generation criterion. Project vehicle trip generation is based on empirical rates using PTDM data, adjusted for local mode split and vehicle occupancy rates as discussed previously.

Table A-1 Project Vehicle Trip Generation

Period	Criteria (trips)	Build (trips)	Exceeds Criterion?
Weekday Daily	2,000	15,732	Yes
Weekday Morning Peak Hour	240	1,538	Yes
Weekday Evening Peak Hour	240	1,583	Yes

The Project is expected to exceed the Planning Board Criteria for daily, morning peak, and evening peak Project vehicle trip generation under the Build program.

Criterion B – Vehicle LOS

The criteria for a Project's impact to traffic operations at signalized intersections are summarized in **Table B-1** below. These criteria are evaluated for each signalized study-area intersection and presented in **Table B-2**.

Table B-1 CRITERION - Vehicular Level of Service

Existing	With Project
VLOS A	VLOS C
VLOS B, C	VLOS D
VLOS D	VLOS D or 7% roadway volume increase
VLOS E	7% roadway volume increase
VLOS F	5% roadway volume increase

Table B-2 – Vehicular LOS

Intersection	Morning Peak Hour				Evening Peak Hour			
	Existing Condition	Build Condition	Traffic Increase	Exceeds Criterion?	Existing Condition	Build Condition	Traffic Increase	Exceeds Criterion?
Concord Avenue at Blanchard Road/ Griswold Street	F	F	42%	Yes	E	F	48%	Yes
Concord Avenue at Spinelli Place*	B	D	n/a	No	A	C	n/a	No
Concord Avenue at Smith Place*	A	E	n/a	Yes	A	E	n/a	Yes
Concord Avenue at Moulton Street	A	B	n/a	No	B	C	n/a	Yes
Concord Avenue at Fawcett Street	B	F	n/a	Yes	B	F	n/a	Yes
Concord Avenue at Wheeler Street*	A	B	n/a	No	A	B	n/a	No
Concord Avenue at Alewife Brook Parkway*	F	F	23%	Yes	F	F	26%	Yes
Concord Avenue at Fresh Pond Parkway*	F	F	9%	Yes	F	F	11%	Yes
Concord Avenue at Walden Street	C	C	n/a	No	C	C	n/a	No
Concord Avenue at Huron Avenue	E	E	7%	No	D	E	7%	Yes
Concord Avenue at Garden Street	C	C	n/a	No	C	D	n/a	No
Fresh Pond Parkway at Huron Avenue	F	F	4%	No	F	F	4%	No
Alewife Brook Parkway at Terminal Road/ Fresh Pond Mall	B	E	n/a	Yes	B	B	n/a	No
Alewife Brook Parkway at Rindge Avenue	E	F	16%	Yes	F	F	15%	Yes
Alewife Brook Parkway at Cambridgepark Dr	D	E	14%	Yes	E	F	13%	Yes
Alewife Brook Parkway at Concord Turnpike (Route 2)	D	D	8%	Yes	D	D	8%	Yes
Massachusetts Avenue at Alewife Brook Parkway	F	F	6%	Yes	F	F	5%	No
Rindge Avenue at Sherman Street	C	C	n/a	No	C	C	n/a	No
Garden Street at Walden Street	D	D	0%	No	C	C	n/a	No
Garden Street at Sherman Street at Huron Avenue	E	E	1%	No	D	D	1%	No

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**.

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

25 of the 59 roadway segments in the study area are identified as street segments that have more than 1/3 of residential frontage, and therefore, are evaluated against the traffic volume criteria. The results are presented in **Table C-2**.

Table C-2 Traffic on Residential Streets

Roadway	Segment	Amount of Residential	Morning Peak Hour			Evening Peak Hour		
			Existing[1]	Increase[2]	Exceeds Criterion?	Existing[1]	Increase[2]	Exceeds Criterion?
Concord Avenue	Hamilton Road to Blanchard Road/Griswold Street	1/2 or more	516	140	Yes	500	160	Yes
	Fayerweather Street to Walden Street	1/2 or more	935	105	Yes	980	120	Yes
	Walden Street to Appleton Street	1/2 or more	865	100	Yes	945	115	Yes
	Chauncy Street to Garden Street	>1/3 but <1/2	915	85	Yes	845	100	Yes
Blanchard Road	Merrill Avenue to Concord Avenue	1/2 or more	915	370	Yes	875	410	Yes
Griswold Street	Concord Avenue to Sunset Road	1/2 or more	47	0	No	39	0	No
Walden Street	Sherman Street to Garden Street	1/2 or more	795	5	No	896	5	No
	Garden Street to Fayerweather Street	1/2 or more	590	5	No	635	5	No
	Copley Street to Concord Avenue	1/2 or more	620	5	No	725	5	No
	Concord Avenue to Saville Street	1/2 or more	530	0	No	530	0	No
Huron Avenue	Cutler Ave to Garden Street/Sherman Street	1/2 or more	335	5	No	422	5	No
	Garden Street/Sherman Street to Daniel R Tierney Street	1/2 or more	555	5	No	695	5	No
	Fresh Pond Parkway to Larch Road	>1/3 but <1/2	690	0	No	750	0	No
	Larchwood Drive to Fresh Pond Parkway	1/2 or more	840	15	No	887	15	No
Garden Street	Ivy Street to Walden Street	1/2 or more	495	0	No	460	0	No
	Walden Street to Stearns Street	1/2 or more	280	0	No	161	0	No
	Winslow Street to Huron Avenue	1/2 or more	231	0	No	130	0	No
	Huron Avenue to Gray Gardens	1/2 or more	350	0	No	150	0	No
Rindge Avenue	Alewife Brook Parkway to Clifton Street	>1/3 but <1/2	730	80	Yes	780	80	Yes
	Clay Street to Sherman Street	1/2 or more	675	80	Yes	595	80	Yes
	Sherman Street to Reed Street/ Sargent Street	1/2 or more	710	70	Yes	460	65	Yes
Fresh Pond Parkway	Larch Road to Huron Avenue	1/2 or more	1,705	90	Yes	1,695	100	Yes
	Huron Avenue to Fresh Pond Lane	1/2 or more	1,615	75	Yes	1,572	85	Yes
Sherman Street	Rindge Avenue to Pemberton Street	1/2 or more	645	10	No	435	15	No
	Winslow Street to Huron Avenue	1/2 or more	351	0	No	377	0	No

1 Where driveways/on-street parking created a segment inflow/outflow volume imbalance, an average was calculated per direction and added

2 Net new project trips after trip credits are applied

Criterion D – Lane Queue

The criteria for a Project's impact to queues at signalized intersections are summarized in **Table D-1** below. These criteria are evaluated for each lane group at study-area signalized intersections and presented in **Table D-2**.

Table D-1 CRITERION – Vehicular Queues at Signalized Intersections

Existing Queue Length	Expected Queue Length with Project Trips
Under 15 vehicles	Under 15 vehicles, or 15+ vehicles with an increase of 6 vehicles
15 or more vehicles	Increase of 6 vehicles

Table D-2 Length of Vehicular Queues at Signalized Intersections

		Morning Peak Hour			Evening Peak Hour		
Intersection	Lane Group	Existing Condition	Build Condition	Exceeds Criterion?	Existing Condition	Build Condition	Exceeds Criterion?
Concord Avenue at Blanchard Road/ Griswold Street	Concord Avenue EB L/T	9	15	No	4	7	No
	Concord Avenue EB T/R	6	14	No	4	7	No
	Concord Avenue WB L	6	13	No	8	20	Yes
	Concord Avenue WB T	5	8	No	6	11	No
	Concord Avenue WB R	3	4	No	5	24	Yes
	Blanchard Road NB L/T	12	12	No	10	12	No
	Blanchard Road NB R	0	0	No	0	0	No
	Blanchard Road SEB L/T/R	26	49	Yes	12	18	No
Concord Avenue at Moulton Street	Concord Avenue EB L/T	3	31	Yes	2	6	No
	Concord Avenue EB T/R	3	31	Yes	2	6	No
	Concord Avenue WB L/T/R	4	8	No	4	14	No
	Driveway NB L/T/R	0	0	No	1	1	No
	Moulton Street SB L/T/R	1	3	No	3	5	No
Concord Avenue at Fawcett Street	Concord Avenue EB L/T	3	8	No	3	6	No
	Concord Avenue EB T	3	8	No	3	6	No
	Concord Avenue WB T/R	7	24	Yes	5	11	No
	Fawcett Street SB L/R	3	9	No	3	26	Yes
Concord Avenue at Walden Street	Concord Avenue EB L	1	1	No	3	3	No
	Concord Avenue EB T/R	10	11	No	11	15	No
	Concord Avenue WB L/T/R	7	9	No	10	11	No
	Walden Street NB L/T/R	6	6	No	7	7	No
	Walden Street SB L/T/R	11	11	No	8	8	No
Concord Avenue at Huron Avenue	Concord Avenue EB L/T/R	7	9	No	9	14	No
	Concord Avenue WB L/T/R	10	11	No	12	13	No
	Huron Avenue NB L/T/R	11	12	No	8	9	No
	Huron Avenue SB L/T/R	8	8	No	9	9	No

Table D-2 Length of Vehicular Queues at Signalized Intersections

Concord Avenue at Garden Street	Concord Avenue SEB T	12	12	No	9	9	No
	Garden Street NB L/T	10	12	No	12	13	No
	Garden Street SB T	5	5	No	5	5	No
Fresh Pond Parkway at Huron Avenue	Huron Avenue EB L	2	2	No	2	2	No
	Huron Avenue EB T/R	29	30	No	18	18	No
	Huron Avenue WB L	0	0	No	1	1	No
	Huron Avenue WB T/R	6	6	No	8	8	No
	Fresh Pond Parkway NB L/T	11	12	No	11	12	No
	Fresh Pond Parkway NB T/R	11	12	No	11	12	No
	Fresh Pond Parkway SB L/T	16	17	No	14	16	No
	Fresh Pond Parkway SB T/R	16	17	No	13	15	No
Alewife Brook Parkway at Terminal Road/ Fresh Pond Mall	Terminal Road EB R	0	0	No	2	3	No
	Fresh Pond Mall Driveway WB R	1	2	No	7	10	No
	Alewife Brook Parkway NB T	10	26	Yes	12	19	Yes
	Alewife Brook Parkway NB R	0	0	No	0	1	No
	Alewife Brook Parkway SB T	10	13	No	19	25	No
	Alewife Brook Parkway SB R	0	1	No	1	1	No
Alewife Brook Parkway at Rindge Avenue	Rindge Avenue WB L	6	9	No	3	4	No
	Rindge Avenue WB R	16	16	No	16	16	No
	Alewife Brook Parkway NB T/R	42	70	Yes	32	45	Yes
	Alewife Brook Parkway SB T	10	10	No	10	10	No
Alewife Brook Parkway at Cambridgepark Drive	Cambridgepark Drive EB L	2	2	No	2	2	No
	Alewife Brook Parkway NB L	5	5	No	4	3	No
	Alewife Brook Parkway NB T	5	5	No	5	6	No
	Alewife Brook Parkway SB T	20	27	Yes	33	44	Yes
Alewife Brook Parkway (ABP) at Concord Turnpike (Route 2)	Route 2 (Signal 16b) EB L	44	43	No	100+	100+	No
	Route 2 (Signal 16d) EB T	34	39	No	100+	100+	No
	Alewife Station Ramp (16c) WBT	3	3	No	6	5	No
	Alewife Station Ramp (16c) WBR	2	2	No	3	2	No
	ABP (Signal 16b) NB T	18	13	No	28	26	No

Table D-2 Length of Vehicular Queues at Signalized Intersections

	ABP (Signal 16c) NB T	2	3	No	3	3	No
	ABP (Signal 16b) SB T	5	7	No	4	5	No
	ABP (Signal 16a) SB R	20	20	No	17	14	No
Massachusetts Avenue at Alewife Brook Parkway	Massachusetts Avenue EB L/T	11	11	No	6	6	No
	Massachusetts Avenue EB T	11	11	No	8	9	No
	Massachusetts Avenue EB R	6	6	No	4	5	No
	Massachusetts Avenue WB L	11	13	No	13	14	No
	Massachusetts Avenue WB L/T	10	12	No	14	14	No
	Massachusetts Avenue WB T/R	6	6	No	11	11	No
	Alewife Brook Parkway NB L	3	4	No	3	3	No
	Alewife Brook Parkway NB T	10	11	No	23	27	No
	Alewife Brook Parkway NB T/R	10	11	No	23	27	No
	Alewife Brook Parkway SB L	2	2	No	3	3	No
	Alewife Brook Parkway SB T	31	31	No	31	31	No
	Alewife Brook Parkway SB T/R	1	1	No	30	30	No
Rindge Avenue at Sherman Street	Rindge Avenue EB T/R	1	1	No	2	2	No
	Rindge Avenue WB L/T	8	10	No	6	7	No
	Sherman Street NB L/R	4	4	No	8	8	No
Garden Street at Walden Street	Garden Street EB L/T/R	5	5	No	6	6	No
	Garden Street WB L/T/R	1	1	No	1	1	No
	Walden Street NB L/T/R	3	3	No	7	7	No
	Walden Street SB L/T/R	12	12	No	8	8	No
Garden Street at Sherman Street at Huron Avenue	Garden Street EB L/T/R	9	9	No	3	3	No
	Huron Avenue NB L/T/R	6	6	No	12	12	No
	Huron Avenue SB L/T/R	10	11	No	8	8	No
	Sherman Street SEB L/T/R	11	11	No	4	4	No

Criterion E – Pedestrian and Bicycle Facilities

Criteria 1: 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 (PLOS) 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 and full build conditions.

Table E-1 CRITERION – PLOS 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 Study Area Intersections PLOS Summary

		Morning Peak Hour			Evening Peak Hour		
Intersection	Crosswalk	Existing Condition	Build Condition	Exceeds Criterion?	Existing Condition	Build Condition	Exceeds Criterion?
Concord Avenue at Blanchard Road/ Griswold Street	East	F	F	Yes	E	E	Yes
	West	F	F	Yes	E	E	Yes
	North	F	F	Yes	E	E	Yes
	South	F	F	Yes	E	E	Yes
Concord Avenue at Spinelli Place	East	D	F	Yes	F	F	Yes
	North	A	A	No	A	A	No
Concord Avenue at Smith Place	West	F	D	No	E	D	No
	North	A	D	Yes	A	D	Yes
Concord Avenue at Moulton Street	East	D	D	No	D	D	No
	North	D	D	No	D	D	No
Concord Avenue at Fawcett Street	West	D	D	No	D	D	No
	North	D	D	No	D	D	No
Concord Avenue at Wheeler Street	West	E	F	Yes	E	F	Yes
	North	A	A	No	A	A	No
Concord Avenue at Walden Street	East	C	C	No	C	C	No
	West	C	C	No	C	C	No
	North	B	B	No	B	B	No
	South	B	B	No	B	B	No
Concord Avenue at Huron Avenue	East	C	C	No	C	C	No
	West	C	C	No	C	C	No
	North	B	B	No	B	B	No

Table E-2 Study Area Intersections PLOS Summary

Intersection	Crosswalk	Morning Peak Hour			Evening Peak Hour		
		Existing Condition	Build Condition	Exceeds Criterion?	Existing Condition	Build Condition	Exceeds Criterion?
Concord Avenue at Garden Street	South	B	B	No	B	B	No
	Northwest	B	B	No	B	B	No
	South	D	D	No	D	D	No
Fresh Pond Parkway at Huron Avenue	East	E	E	Yes	E	E	Yes
	West	E	E	Yes	E	E	Yes
	North	E	E	Yes	E	E	Yes
	South	E	E	Yes	E	E	Yes
Alewife Brook Parkway at Terminal Road/Fresh Pond Mall	East	E	E	Yes	F	F	Yes
	West	E	E	Yes	F	F	Yes
	North	D	D	No	E	E	Yes
Alewife Brook Parkway at Rindge Avenue	East	E	E	Yes	E	E	Yes
	South	E	E	Yes	E	E	Yes
Alewife Brook Parkway at Concord Turnpike (Route 2)	East	E	E	Yes	E	E	Yes
Massachusetts Avenue at Alewife Brook Parkway	East	F	F	Yes	F	F	Yes
	West	F	F	Yes	F	F	Yes
	North	F	F	Yes	F	F	Yes
	South	F	F	Yes	F	F	Yes
Rindge Avenue at Sherman Street	East	D	D	No	D	D	No
	North	D	D	No	D	D	No
Garden Street at Walden Street	East	C	C	No	C	C	No
	West	C	C	No	C	C	No
	North	C	C	No	C	C	No
	South	C	C	No	C	C	No
Garden Street at Sherman Street at Huron Avenue	East	F	F	Yes	E	E	Yes
	West	F	F	Yes	E	E	Yes
	North	F	F	Yes	E	E	Yes
	Northwest	F	F	Yes	E	E	Yes
	South	F	F	Yes	E	E	Yes

Criteria 2 & 3: Safe Pedestrian and Bicycle Facilities

Safe pedestrian and bicycle facilities are off-road or non-street bicycle lanes and sidewalks that are along a publicly accessible street.

Table E-3 presents the indicators for this criterion. The evaluation of sidewalks or walkways and bicycle facilities are displayed.

Criteria E-3 – Pedestrian and Bicycle Facilities

Adjacent Street	Link (between)	Sidewalk or Walkway Present?	Exceeds Criteria?	Bicycle Facilities or Rights of Way Present?	Exceeds Criteria?

Concord Ave	Blanchard Road to Smith Place	Yes	No	Yes	No
	Smith Place to Moulton Street	Yes	No	Yes	No
	Moulton Street to Fawcett Street	Yes	No	Yes	No
	Fawcett Street to Wheeler Street	Yes	No	Yes	No

Figure A: Site Context Map

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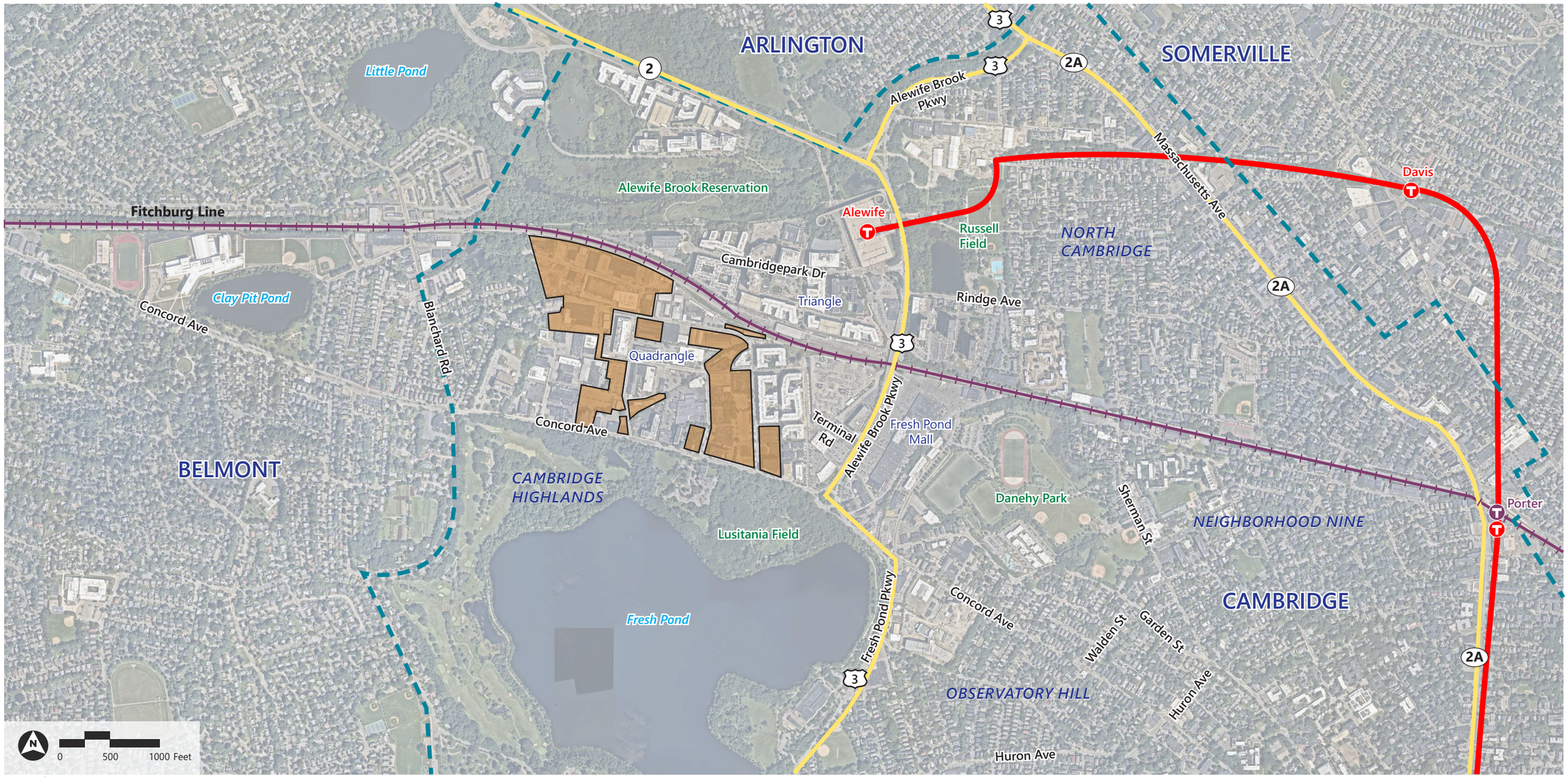
02/05/2026



Legend:

- Healthpeak Sites
- MBTA Commuter Rail Line
- MBTA Red Line
- Municipal Boundary
- State/US Highway Route
- MBTA Station

Source: Nearmap Aerial dated 10/19/2024; MBTA System Map 2025.

Figure B: Neighborhood Context Map

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02/05/2026

Source: Nearmap Aerial dated 10/29/2024.