

Ref: 8451

February 1, 2021

Arlington Zoning Board of Appeals Town of Arlington 51 Grove Street Arlington, MA 02476

Re: Responses to TAC Executive Committee Comment Letter Thorndike Place Traffic Impact Assessment Proposed 176-Unit Residential Development Arlington, Massachusetts

Dear Zoning Board of Appeals:

Vanasse & Associates, Inc. (VAI) is pleased to submit responses to the January 6, 2021 letter from the TAC Executive Committee. For ease of review, we have listed the comments followed by our responses:

#### TAC Review Letter – January 6, 2021

Comment No. 1a: *"The proponent should consider providing subsidized MBTA passes in the proposed TDM program."* 

- **Response**: The developer believes that the location of the project in close proximity to public transit will result in a demand for potential residents that will desire this alternative transportation; therefore, there is no need for subsidies to use transit. To encourage non-vehicle transportation, the Project proposes a transit screen encouraging multimodal transportation, covered bicycle parking, and a Bluebikes docking station.
- Comment No. 1b: "The project proposes an average of 1.3 parking spaces per unit which the Executive Committee believes is too high for a transit-oriented development (TOD). The Committee recommends the Board of Appeals reduce the required number of spaces as allowed by the Zoning Code. A maximum of one space per unit is more appropriate for a TOD. This would be consistent with the findings in the MAPC Perfect Fit Parking for metro Boston (Arlington was included in the report)."

Response: So noted.

Comment No. 1c: "Vox on 2 is approximately 0.5 mile from the Alewife Station whereas the proposed development is 0.8 miles from the station. Should the vehicle mode share be increased to reflect that the proposed project is farther from the station than Vox on 2?"



**Response**: The Project is not in fact much further from the Alewife Station than the Vox on Two development. It is not clear how the 0.8 miles dimension for the distance between the Project and Alewife Station was derived. Both on a general location and a walking path basis, the two sites have a similar distance/walking time to Alewife Station. On a general locational basis, both sites are within a 0.5- to 0.6mile radius of Alewife Station. On a walking path basis (using available sidewalks and walking routes), the Vox on Two development is located 0.6 miles or a 12minute walk from Alewife Station, while the Project main entrance on Dorothy Road is located 0.7 miles or a 13- minute walk from Alewife Station. The Vox on Two mode split survey indicates 19 percent of commuters bike or walk to work. The US Census data for Census Tract 3561, the tract in which the Project site is located, was compared to the Vox on Two mode split to determine if adjustment to the mode split for analysis was required. The census data indicates 6.1 percent of commuters bike and 0.0 percent walk. However, the Vox survey also indicates 1 percent "other" trips while the census data suggests 7.8 percent "other" trips. The bicycle volumes are similar from both sources. Therefore, the estimated pedestrian volumes may be higher using the Vox on Two survey than

6.1 percent of commuters bike and 0.0 percent walk. However, the Vox survey also indicates 1 percent "other" trips while the census data suggests 7.8 percent "other" trips. The bicycle volumes are similar from both sources. Therefore, the estimated pedestrian volumes may be higher using the Vox on Two survey than that of the Census data; however, 8 percent of the 14 percent walking trips would be converted to other trips using the census data, leaving a 6 percent increase in the auto mode share. A 6 percent increase in auto mode share would increase the anticipated site volumes by 56 daily trips, 4 weekday morning peak-hour trips and 5 weekday evening peak-hour trips. The estimated bicycle volumes would be the same using either set of data and the pedestrian volumes are high using the Vox on Two data. However, the estimated vehicle volumes do not change significantly if the pedestrian mode share is reduced to 0 in the analysis.

Comment No. 1d: "Add to Beta comment T20 that the dramatic level of service (LOS) improvements on Lake Street EB at Brooks Avenue do not seem correct. The TIA shows LOS improves from E to A in the AM and from D to A in the PM. Previous analyses of the then proposed Lake Street signals did not yield such dramatic improvements in LOS."

**Response**: There were errors in the analysis of the new pedestrian signal on Lake Street. These errors have been rectified and the updated analysis can be found in Table 12R. In addition, since the new traffic signal equipment has been installed at the Lake Street intersections with the Bikeway and Brooks Avenue, these locations have analyzed with the design timings and phasings under 2020 Baseline Conditions as well as Future Conditions.

As shown in Table 12R, the overall LOS at the bikeway intersection under 2020 Baseline conditions operates at LOS E with 59 seconds of average delay during the weekday morning peak hour. Under 2027 No-Build and Build conditions the intersection continues to operate at LOS E but with 65 seconds of average delay. During the weekday evening peak hour, the overall LOS at the bikeway intersection under 2020 Baseline conditions operates at LOS D with 40 seconds of average delay. Under 2027 No-Build and Build conditions the intersection continues to operate at LOS D but with 41 seconds of average delay. The intersection of Lake Street with Brooks Avenue operates at LOS E during the 2020 Baseline, 2027 No-Build, and 2027 Build conditions during the weekday morning



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peak hour. During the weekday evening peak hour, the intersection operates at LOS D under 2020 Baseline, 2027 No-Build, and 2027 Build conditions. The Project traffic volumes do not change the overall LOS service at these intersections under 2027 Build conditions.



# Table 12R SIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

	2020 Baseline				2027 No-Build				2027 Build			
Intersection/ Critical Movement/Peak Hour	V/C <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup> 50 <sup>th</sup> /95 <sup>th</sup>	V/C	Delay	LOS	Queue 50 <sup>th</sup> /95 <sup>th</sup>	V/C	Delay	LOS	Queue 50 <sup>th</sup> /95 <sup>th</sup>
Lake Street at Minuteman Commuter Bikeway:												
Weekday Morning:												
Lake Street EB TH	0.49	45	D	119/162	0.53	60	Е	132/180	0.54	61	Е	134/182
Lake Street WB TH	0.77	68	E	535/591	0.82	68	Е	569/580	0.82	68	Е	570/580
Overall		59	Е			65	Е			65	Е	
Weekday Evening:												
Lake Street EB TH	0.69	61	Е	208/282	0.73	62	Е	230/312	0.73	62	E	233/316
Lake Street WB TH	0.44	8	Α	213/289	0.46	9	А	226/307	0.47	9	Α	31/45
Overall		40	D			41	D			41	D	
LAKE STREET AT BROOKS AVENUE												
Weekday Morning												
Lake Street EB LT/TH/RT	0.57	36	D	224/326	0.64	53	D	246/442	0.64	57	Е	249/448
Lake Street WB LT/TH/RT	0.94	>80	F	557/790	1.03	>80	F	635/877	1.03	>80	F	636/879
Brooks Avenue NB LT/TH/RT	0.39	38	D	14/32	0.50	38	D	23/44	0.50	38	D	23/44
Brooks Avenue SB LT/TH/RT	0.52	14	В	5/37	0.48	11	В	5/35	0.48	11	В	5/35
Overall		60	Е			68	Е			69	Е	
Weekday Evening:												
Lake Street EB LT/TH/RT	0.83	62	Е	251/620	0.87	74	Е	274/672	0.88	75	Е	281/678
Lake Street WB LT/TH/RT	0.49	12	В	159/269	0.51	13	В	171/284	0.52	13	В	174/289
Brooks Avenue NB LT/TH/RT	0.18	27	С	8/23	0.29	29	С	11/29	0.29	29	С	11/29
Brooks Avenue SB LT/TH/RT	0.50	13	В	2/32	0.50	13	В	2/33	0.50	13	В	2/33
Overall		40	D			47	D			47	D	

<sup>a</sup>Volume to capacity ratio. <sup>b</sup>Average stopped delay per vehicle (in seconds). <sup>c</sup>Level-of-service.

<sup>d</sup>Queue length in feet.



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# Comment No. 1e: "Table 7 of the TLA should be expanded to include traffic volumes and percentage increases on Lake St. between Littlejohn Street and Route 2, and between Margaret Street and Brooks Ave." Response: Table 7 has been revised to include traffic volume increases on Lake Street west of Littlejohn Street and on Lake Street west of Margaret Street. As can be seen in Table 7B, the traffic volume increases on Lake Street east of

As can be seen in Table 7R, the traffic volume increases on Lake Street east of Margaret Street and west of Littlejohn Street range from 9 to 21 vehicles which equates to a percent increase between 0.5 percent and 1.5 percent.



#### Table 7R PEAK-HOUR TRAFFIC-VOLUME INCREASES<sup>a</sup>

Location/Peak Hour	2027 No-Build	2027 Build	Traffic-Volume Increase Over No-Build	Percent Increase Over No-Build
Route 2 west of Lake Street				
Weekday Morning	1,958	1,970	12	0.6
Weekday Evening	1,913	1,928	15	0.8
Lake Street, west of Route 2 EB On/Off-Ramps:				
Weekday Morning	1,444	1,447	3	0.2
Weekday Evening	1,554	1,557	3	0.2
Massachusetts Avenue, north of Lake Street:				
Weekday Morning	2,171	2,175	4	0.2
Weekday Evening	1,999	2,004	5	0.3
Massachusetts Avenue, south of Lake Street:				
Weekday Morning	1,998	2,003	5	0.3
Weekday Evening	2,004	2,011	7	0.3
Alewife Brook Parkway, south of Route 2:				
Weekday Morning	3,259	3,262	3	0.1
Weekday Evening	3,093	3,096	3	0.1
Dorothy Road, east of the Site Drive				
Weekday Morning	49	63	14	28.6
Weekday Evening	35	60	25	71.4
Margaret Street, south of Lake Street				
Weekday Morning	62	76	14	22.6
Weekday Evening	116	141	25	21.6
Littlejohn Street, south of Lake Street				
Weekday Morning	49	62	13	26.5
Weekday Evening	35	43	8	22.9
Lake Street, west of Littlejohn Street				
Weekday Morning	1,805	1,823	18	1.0
Weekday Evening	1,438	1,459	21	1.5
Lake Street, east of Margaret Street				
Weekday Morning	1,781	1,790	9	0.5
Weekday Evening	1,505	1,517	12	0.8

<sup>a</sup>Two-way traffic total.

# **Comment No. 1f:** *"The operations analysis should be expanded to include a discussion of queueing on Lake Street at the bikeway and at Brooks Avenue."*

**Response**: The analysis for these two intersections was updated based on comments received from the Town of Arlington Peer Reviewer BETA Group, Inc. (BETA). The results of the updated analysis are shown in Table 12R, provided previously.



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As shown in Table 12R, the intersection of Brooks Avenue with Lake Street, under 2020 Baseline conditions, during the weekday morning peak hour, has a critical westbound average queue that is 557 feet and a 95<sup>th</sup> percentile queue that is 790 feet. Under 2027 No-Build conditions the critical westbound average queue is 635 feet and the 95<sup>th</sup> percentile queue is 877 feet. The addition of project volumes under 2027 Build conditions increase the queues by 1-2 feet. Under 2020 Baseline conditions, during the weekday evening peak hour, the critical eastbound average queue is 251 feet and the 95<sup>th</sup> percentile queue is 620 feet. Under 2027 No-Build conditions the critical eastbound average queue is 672 feet. The addition of project volumes under 2027 No-Build conditions the critical eastbound average queue is 672 feet. The addition of project volumes under 2027 Build conditions the critical eastbound average queue is 672 feet. The addition of project volumes under 2027 Build conditions the critical eastbound average queue is 672 feet. The addition of project volumes under 2027 Build conditions the critical eastbound average queue is 672 feet. The addition of project volumes under 2027 Build conditions increase the queue by 6-8 feet.

In addition, the intersection of the bikeway with Lake Street, under 2020 Baseline conditions, during the weekday morning peak hour, has a critical westbound average queue that is 535 feet and a 95<sup>th</sup> percentile queue that is 591 feet. Under 2027 No-Build conditions the critical westbound average queue is 569 feet and the 95<sup>th</sup> percentile queue is 580 feet. The addition of project volumes under 2027 Build conditions increase the queue by 2 feet. Under 2020 Baseline conditions, during the weekday evening peak hour, the critical eastbound average queue is 208 feet and the 95<sup>th</sup> percentile queue is 289 feet. Under 2027 No-Build conditions the critical eastbound average queue is 312 feet. The addition of project volumes under 312 feet. The addition of project volumes under 312 feet. The addition of project volumes under 2027 Build conditions increase the queue is 312 feet.

# Comment No. 1g: "Consideration should be given to locating the proposed Bluebikes station farther to the west near the west end of the Thorndike Field parking lot."

Response: Based on discussion with Bluebikes representatives as well as Arlington's Zoning ByLaw Section 6.1.5 Parking Reduction in Business, Industrial, and Multi-Family Residential Zones, the Bluebikes station will be placed on-site rather than near Thorndike Field. This provides further separation from the existing station as requested by Bluebikes, and also satisfies one of the Town's Transportation Demand Management measures.

# Comment No. 1h: "In T15 include changes in student attendance at the Hardy School in the review of 2020 volumes."

**Response**: The Hardy School Expansion was included in the future 2027 No-Build condition. The Hardy Elementary School located at 52 Lake Street began construction on a three-story, six-classroom expansion in 2018. The construction is complete but enrollment in the school has remained generally the same since 2017 with approximately 450 students according to the Massachusetts Department of Elementary and Secondary Education (MDESE).<sup>1</sup> Therefore, it was assumed that the increase in student enrollment due to the expansion would happen in the future condition.

<sup>&</sup>lt;sup>1</sup>Massachusetts Department of Elementary and Secondary Education - Massachusetts School and District Profiles; 2020; profiles.doe.mass.edu/general/general.aspx?topNavID=1.



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## Comment No. 2a: "T32. Existing signed turning restrictions exist from 7-9 AM and from 4-7 PM on weekdays from Lake Street onto Wilson Avenue, Littlejohn Street, and Homestead Road (Note: The Beta review incorrectly indicates there is also a turn restriction on Burch Street). Assess the impact of this restriction and clarify whether discontinuance of this restriction is proposed."

**Response:** As existing turning restrictions exist from 7:00 to 9:00 AM and from 4:00 to 7:00 PM on weekdays from Lake Street onto Wilson Avenue, Littlejohn Street, and Homestead Road. The 2027 Build analysis was revised to send all entering vehicles to Margaret Street. Table 11R below summarizes the results. A discontinuance of this restriction is not being proposed.



# Table 11R

# UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

Intersection/	2020 Baseline				2027 No-Build				2027 Build			
Critical Movement/Peak Hour	V/C <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Lake Street at Wilson Avenue: Weekday Morning:												
Wilson Avenue NB LT/RT Weekday Evening:	0.11	>50	F	10	0.13	>50	F	10	0.14	>50	F	13
Wilson Avenue NB LT/RT	0.13	36	Е	10	0.15	40	Е	13	0.15	42	Е	13
<b>Lake Street at Littlejohn Street:</b> Weekday Morning:												
Littlejohn Street NB LT/RT Weekday Evening:	0.47	>50	F	50	0.56	>50	F	60	0.87	>50	F	103
Littlejohn Street NB LT/RT	0.18	35	Е	15	0.20	39	Е	18	0.31	48	Е	30
Lake Street at Homestead Road: Weekday Morning:												
Homestead Road NB LT/RT Weekday Evening:	0.13	>50	F	10	0.16	>50	F	13	0.29	>50	F	23
Homestead Road NB LT/RT	0.08	28	D	8	0.09	31	D	8	0.09	31	D	8
Lake Street at Burch Street and Alfred Road: Weekday Morning:												
Burch Street NB LT/TH/RT	0.23	43	Е	20	0.27	>50	F	25	0.27	>50	F	25
Alfred Road SB LT/TH/RT Weekday Evening:	0.13	38	Е	10	0.15	44	Е	13	0.15	45	Е	13
Burch Street NB LT/TH/RT	0.24	47	Е	23	0.28	>50	F	25	0.28	>50	F	25
Alfred Road SB LT/TH/RT	0.05	41	Е	5	0.06	48	Е	5	0.06	48	Е	5
Lake Street at Margaret Street and Lakehill Avenue: Weekday Morning:												
Margaret Street NB LT/TH/RT	0.67	>50	F	73	0.80	>50	F	83	0.89	>50	F	100
Lakehill Avenue SB LT/TH/RT Weekday Evening:	0.16	34	D	15	0.20	40	Е	18	0.20	41	Е	18
Margaret Street NB LT/TH/RT	0.78	>50	F	98	0.90	>50	F	113	0.98	>50	F	125
Lakehill Avenue SB LT/TH/RT	0.34	>50	F	33	0.40	>50	F	38	0.48	>50	F	45
Dorothy Road/Littlejohn Street at Site Driveway: Weekday Morning:												
Site Driveway NB TH/RT Weekday Evening:	Intersection constructed under 2027 Build conditions								0.03	9	А	2
Site Driveway NB TH/RT									0.02	9	А	1

<sup>a</sup>Volume to capacity ratio. <sup>b</sup>Delay in seconds per vehicle.

<sup>c</sup>Level of service.

<sup>d</sup>95th percentile queue length in feet.

NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.



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## Comment No. 2b: "T41. Quantify and analyze the effect of construction on the Dorothy Road neighborhood. It is expected that the earthwork required for the site will result in a significant number of trips for large dump trucks, in addition to other construction vehicles related to the grading and construction of the Site building. Verify turning path of large construction vehicles at affected intersections within the neighborhood and to/from Lake Street."

**Response:** BETA Comment No. 41 is responded to by BSC Group in a separate response letter, which indicates that a pre-construction coordination meeting will occur with the general contractor and town staff including emergency response personnel to identify specifics related to access paths and construction vehicle traffic control measures. As additional information concerning these measures are provided to the ZBA, such information will also be provided to the TAC.

### Comment No. 2c: "T42. Provide additional commentary on the impact of the Project on the Dorothy Road neighborhood, including summarizing expected increases in daily and peak hourly traffic on Littlejohn Street, Dorothy Road, Burch Street and Margaret Street."

**Response**: Table 7R provided for Comment No. 1e shows the traffic-volume increases on Littlejohn Street and Dorothy Road due to the Project. The analysis was updated to send site traffic onto Margaret Street instead of Burch Street, so the traffic-volume increases for Margaret Street have been provided in Table 7R.

As can be seen in Table 7R, Traffic volume increases range from 21.6 to 71.4 percent on Dorothy Road, Littlejohn Street, and Margaret Street. The percent increases are large due to the low existing volumes on these streets. Increases of 8-25 vehicles per hour equates to one additional vehicle every 2.4 to 7.5 minutes which is a minor increase in traffic to the area.



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It is anticipated that this information addresses the comments. Please feel free to contact us directly if there should be any further clarification needed.

Sincerely,

VANASSE & ASSOCIATES, INC.

Scott W. Thornton, P.E. Principal

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Derek Roach, P.E. Transportation Engineer

Enclosure:

Technical Appendix

cc: Town of Arlington – Jennifer Raitt Town of Arlington – TAC Executive Committee BETA Group, Inc. – Greg E. Lucas, P.E., P.T.O.E, R.S.P

