IMPROVING COMMUNITIES TOGETHER

July 29, 2020

Jennifer Raitt
Director of Planning and Community Development
Town of Arlington
730 Massachusetts Avenue Annex
Arlington, MA 02476

Re: Thorndike Place – Arlington, MA
Traffic Peer Review

Ms. Raitt,

BETA Group, Inc. (BETA) has reviewed documents for the proposed multi-unit housing development known as Thorndike Place proposed off Dorothy Road in East Arlington, MA (the Site). A Comprehensive Permit Applicant was filed with the Arlington Zoning Board of Appeals (ZBA) on September 1, 2016 under M.G.L. Chapter 40B and 760 CMR 56.03(3)(b). A revised submission was filed with the ZBA in March 2020. This letter is provided to outline BETA's findings, comments, and recommendations relative to **Traffic** issues.

BASIS OF REVIEW

BETA reviewed the following documents:

- ***Traffic Impact and Access Study (TIAS), Mugar Parcel 40B Residential Development, Arlington, Massachusetts,*** dated April 2014 prepared by MDM Transportation Consultants, Inc. of Marlborough, MA
- ***Response to Completeness Review Memo, Thorndike Place, Arlington, MA,*** Memorandum dated March 18, 2020 from Smolak & Vaughan, LLP
- Plans (12 Sheets) entitled: ***Thorndike Place Comprehensive Permit, Dorothy Road, Arlington, Massachusetts*** dated March 13, 2020 prepared by BSC Group of Boston, MA
- Architectural Plans (9 sheets) entitled: ***Thorndike Place, Arlington MA*** revised March 11, 2020 originally prepared by Oaktree Development LLC, Cambridge, MA

Review by BETA included the above items for conformance with the following, as applicable:

- ***Town of Arlington Zoning Bylaw,*** Adopted by Town Meeting on April 22, 2019
    - ***Section 5 District Regulations***
    - ***Section 6 Site Development Standards***
- ***Town of Arlington Zoning Bylaw,*** Adopted October 8, 1975 through Town Meeting of April 2016
    - ***Article 6 General Regulations***
    - ***Article 8 Off Street Parking and Loading***
- ***Transportation impact Assessment (TIA) Guidelines,*** by MassDOT dated March 2014
- ***Manual on Uniform Traffic Control Devices (MUTCD) 2009 and Revisions****, Federal Highway Administration*
- ***Trip Generation Manual, 10th Edition (and Supplement),*** Institute of Transportation Engineers (ITE)
- ***Parking Generation Manual, 5th Edition,*** ITE

PROJECT DESCRIPTION

The Project Site (the Site), commonly known as the Mugar parcel, comprises approximately 17 acres bounded by Route 2, Dorothy Road, Burch Street and Thorndike Field in Arlington, Massachusetts. The Site currently contains undeveloped land.

The project proposes to redevelop the Site to construct a 219-unit residential development consisting of 207 rental apartment units and 12 townhome units. Apartment units are proposed in two (2) four-story buildings, with partial subgrade parking underneath each building. Townhome units are proposed as duplex units in six (6) structures directly abutting Dorothy Road. Site access for the apartment units includes a full access driveway connection to Dorothy Road aligned with Littlejohn Street, a full access driveway intersecting Burch Street, and a gated emergency-only connection to Parker Street.

TRAFFIC IMPACT AND ACCESS STUDY REVIEW

The Traffic Impact and Access Study (TIAS) for the Mugar parcel was prepared in 2014 and submitted as part of the September 2016 Comprehensive Permit Application. The March 2020 revised submission did not include an updated TIAS. Within the December 10, 2019 hearing on the project, the Applicant notified the Board that Vanasse & Associates, Inc. (VAI) had recently joined the project team as traffic consultants and would update the 2014 TIAS.

Given the age of the TIAS, a number of comments on the TIAS are related to the age of the study data, geometric modifications that have since been made to study area roadways and intersections, and updates to standards and/or practices. These comments should not be construed to reflect on the quality of the report, which was prepared in conformance with MassDOT guidelines.

T1. The description of the proposed Site should be updated to reflect the currently proposed number of units.

T2. Existing roadway descriptions should be reviewed and updated as needed, specifically Massachusetts Avenue, which has been reconstructed to provide bicycle lanes.

T3. Intersection descriptions should be reviewed and updated as needed, specifically the Route 2 at Route 16 series of intersections which has seen improvements since the 2014 TIAS was issued, and the Massachusetts Avenue (Routes 2A, 3 & 3A) at Lake Street/Winter Street intersection, which has been reconstructed to provide bicycle lanes and exclusive turn lanes.

T4. March 2014 traffic volumes should be updated with more recent data. Typically, new automatic traffic recorder (ATR) and turning movement counts (TMCs) would be recommended, but the current COVID-19 pandemic has resulted in a reduction in traffic volumes well below typical values. MassDOT's April 2020 *Guidance on Traffic Count Data* memorandum should be consulted if historical counts are utilized.

T5. Intersection crash data should be updated to the most recent data currently available.

T6. Update description of planned area roadway improvements.

T7. Update background development-related growth. The majority of development described in the 2014 TIAS has been built. The development of No-Build traffic volumes must carefully consider the relation between build status and current vacancy rates of background development and the date of traffic counts utilized in the updated TIAS.

T8. Update trip generation for currently proposed number of units, and update land use codes (LUCs) for trip generation based on the latest (10th) edition of ITE's *Trip Generation*.

T9. Update intersection capacity analyses based on updated Existing, No-Build and Build volumes and based on updated lane configurations, where appropriate.

T10. The report Appendix was not provided for review, limiting in-depth review of the project. The Appendix should be made available in conjunction with the updated TIAS.

A detailed review was conducted for the elements of the 2014 TIAS which are not affected by the time elapsed since completion of the TIAS.

STUDY AREA

The study area includes the following intersections:

- Route 2 at Route 16
- Route 2 at Lake Street EB on/off ramps
- Route 2 at Lake Street WB on/off ramps
- Lake Street at Littlejohn Street
- Lake Street at Burch Street
- Massachusetts Avenue at Lake Street
- Burch Street at Site Driveway
- Dorothy Road at Site Driveway

T11. The existing signalized intersection of Lake Street at Brooks Avenue and the proposed signalized intersection of Lake Street at the Minuteman Commuter Bikeway should be included in the study area. The TIAS should describe existing operations at the Minuteman Bikeway crossing and the expected impact of the proposed signalized control.

T12. While Burch Street and Littlejohn Street directly connect to site access driveways, the TIAS should also consider the potential of site-generated vehicles to use Wilson Avenue, Homestead Road and Margaret Street, and discuss the impact of additional site-generated traffic on the respective intersections of these streets with Lake Street.

T13. Existing signed turning restrictions exist from 7-9 AM and from 4-7 PM on weekdays from Lake Street onto Wilson Avenue, Littlejohn Street, Homestead Road and Burch Street. The TIAS should assess the impact of this restriction and clarify whether discontinuance of this restriction is proposed.

TRAFFIC VOLUMES

As noted in comment **T4**, traffic volumes should be updated. The TIAS identifies a daily (2014) volume of approximately 11,265 vehicles per day (vpd) on Lake Street, and 1,425 vpd on the Route 2 westbound off-ramp to Lake Street. Data available from MassDOT's online traffic count database show a daily (2017) volume of approximately 14,950 vpd on Lake Street at Route 2, and 1,300 vpd on the Route 2 westbound off-ramp to Lake Street.

SAFETY

Crash data were obtained from MassDOT for the most recent three-year period available at the time, 2009 through 2011. This shows 64 crashes over the three year period at the complex Route 2 at Route 16 intersection, resulting in a crash rate exceeding statewide and MassDOT District 6 averages for a signalized intersection. **Improvements have since been made at this intersection, which may result in a decrease in crashes.**

The remaining study area intersections experienced a crash rate below the statewide and District 4 average. Different district averages are considered based on the location of the intersection; Arlington and Belmont are in District 4, while Cambridge is in District 6.

PUBLIC TRANSPORTATION

The report notes the proximity of the Alewife "T" Station to the Site. The station serves as the northern terminus of the Red Line subway system, and services MBTA bus routes 62, 67, 76, 79, 84, 350 and 351.

Census 2010 Journey To Work Data is provided indicating that approximately 28% of the residents in Census Tract 3561 (which includes the Site) utilized public transportation (bus and/or subway) as their primary mode to/from work.

T14. The COVID-19 pandemic has resulted in a transformation in work from home strategies and significantly reduced the percentage of people commuting to work, including commuting via public transportation. Consider the long-term effects of this paradigm shift on public transportation use, and the resultant impact on trip generation and parking demand.

T15. Clarify and provide detail for the connection between the Site and the Minuteman Bikeway, including interface with Thorndike Field and its parking area.

T16. Provide graphics showing the expected walking path between the Site and both the Red Line and bus platforms within Alewife Station, including an estimation of walking travel time.

T17. Provide detail regarding the connection between the Site to the existing pedestrian overpass of Route 2, and provide detail regarding the connectivity that the pedestrian overpass affords between the Site and facilities on the south side of Route 2.

T18. Consult with MassDOT on any available structural assessment of the existing pedestrian overpass, and provide comment on its suitability for future use.

NO-BUILD TRAFFIC VOLUMES

No-build traffic volumes were determined by applying a half-percent annual growth rate over a seven-year period, plus the addition of traffic associated with specific area developments. Specific area developments should be updated as noted in comment **T7**.

T19. Revisit growth rate calculations based on updated permanent count station data and based on MassDOT's April 2020 *Guidance on Traffic Count Data* memorandum.

SITE GENERATED TRAFFIC

As noted in comment **T8**, estimation of site-generated traffic (trip generation) should be updated based on the latest edition of ITE's *Trip Generation*. This is not expected to substantially change the data presented in the TIAS, which shows 984 daily vehicular trips, 75 vehicular trips (15 entering, 60 exiting) in the weekday morning peak hour and 82 vehicular trips (60 entering, 22 exiting) in the weekday evening peak hour. Total trips are reduced by 28% to account for residents who will utilize public transportation, in accordance with 2010 Census data. BETA finds that a reduction for transit usage is appropriate.

T20. Census data notes that area residents utilize public transportation as their *primary* travel mode. Consider what percentage, of any, of this group may still utilize a personal vehicle as part of their daily travel.

Empirical trip generation data is provided for similarly-sized residential apartment complex facilities location in Burlington, Waltham and Braintree. Comparison of ITE-based rates to empirical data suggest that the ITE-based rates are conservatively high. **The study utilizes the conservative ITE rates; BETA concurs with this approach.**

TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution was developed primarily based on Journey to work census data. **Trip distribution calculations were not reviewed because the TIAS Appendix was not available for review.**

T21. Percentage distribution shown in Figure 7 for Lake Street northbound at the Route 2 eastbound On-ramp is incorrect and should show 20% straight (northbound) and 35% left onto Route 2 eastbound. Distribution and build volumes should be summarily updated in Figures 8 through 11. It should be noted that the 35% distribution on Route 2 eastbound is shown (and distributed) correctly at the Route 2/ Route 16 intersection in all figures.

BUILD TRAFFIC VOLUMES

Build traffic volumes were compiled by adding development-specific traffic volumes to the No-Build volumes. **Build traffic volumes will require update based upon updates to existing traffic data, background development, growth rate calculations, and trip generation and distribution.**

TRAFFIC OPERATIONS ANALYSIS

Capacity analysis of intersections was performed using the Synchro software using the methods of the 2010 Highway Capacity Manual (HCM). **This methodology is acceptable.**

T22. As noted in comment T9, capacity and queue analysis will require an update based upon updates to existing traffic data, background development, growth rate calculations, and trip generation and distribution.

ALTERNATIVE ACCESS PLAN

The TIAS presents an alternative Build scenario which provides a right-in/right-out driveway on the Route 2 westbound off-ramp to Lake Street. The previously described site driveways at Littlejohn Street and Burch Street would be retained under the alternative access scenario. The alternative access plan reduces impacts at Littlejohn Street and along Lake Street, since site generated traffic bound for Route 2 are projected to use the Route 2 westbound off-ramp, and then either continue onto Route 2 westbound or turn left onto Lake Street to access the Route 2 eastbound on-ramp on the west side of Route 2.

T23. Figures 13 through 17 feature a similar discrepancy in trip distribution and assignment to that noted in comment T15. As in comment T15, the 35% distribution on Route 2 eastbound is shown (and distributed) correctly at the Route 2/ Route 16 intersection in all figures.

T24. The alternative access analysis should include a safety analysis that evaluates the conflict between entering Site vehicles and vehicles that have exited Route 2 and may still be traveling at a higher rate of speed.

T25. As noted in the TIAS, alterations to the Route 2 ramp require coordination with MassDOT. Please provide an update on this coordination.

CONCLUSIONS

The TIAS conclusion states that the Project is a modest traffic generator designed to leverage its proximity to the Minuteman Commuter Bikeway and the Alewife MBTA Station. The TIAS also states that "site-generated traffic increases at the study intersections do not generally result in any material change in overall intersection operations compared to No-Build conditions." This statement cannot be vetted until an updated TIAS is provided based on comments contained herein. Furthermore, the TIAS fails to quantify the specific impact of the Project on the Dorothy Road neighborhood, specifically on Littlejohn Street and Burch Street, which are the primary access points to the proposed rental apartment units. A comparison of Existing and Build volumes contained in the TIAS show that exiting traffic more than doubles on Littlejohn Street and Burch Street in the weekday morning peak hour. This increase is alleviated by the alternative access plan, which allows site generated traffic bound for Route 2 to exit directly onto the Route 2 westbound on-ramp.

T26. 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 buildings. Verify turning path of large construction vehicles at the intersection of Lake Street at Littlejohn Street and at Burch Street.

SITE PLAN, CIRCULATION, AND PARKING

As previously noted, access for the rental apartment units includes a full access driveway connection to Dorothy Road aligned with Littlejohn Street, a full access driveway intersecting Burch Street, and a gated emergency-only connection to Parker Street. The townhome units have driveway access to Dorothy Road.

On-site parking for the apartment units is comprised of 178 underground spaces and 131 surface spaces. Underground spaces include 76 under the West Building and 102 under the larger East Building. Townhome units have 2-car garages accessed by shared driveways. The site satisfies By-law requirements for parking supply based upon the stated configuration of units with two studio units, 103 one-bedroom units, 91 two-bedroom units and 23 three-bedroom units.

T27. Include dimensioning of parking stalls and drive aisles for the parking garage.
T28. Identify snow storage areas, and verify that snow storage will not reduce parking capacity.
T29. Provide driveway widths for the townhomes and clarify the parking capacity of each unit. While the end units have exclusive driveways, the shared driveways do not appear to provide additional parking without obstructing the driveway.
T30. Clarify discrepancies in parking layout and total space count between the Site Plans and Architectural Plans.
T31. Clarify whether visitor parking spaces will be designated, and the suggested number of visitor spaces and resident spaces.
T32. Clarify whether on-street parking will be allowed on the newly-created site roadways.
T33. Designate areas for both short-term and long-term bicycle parking. Short-term parking shall be publicly accessible near pedestrian entrances. Long-term parking is typically in an enclosed, limited access area such as the proposed parking garage.
T34. Four accessible spaces are shown adjacent to the entrance to the East Wing of the rental apartment building. Verify that additional accessible spaces can reasonably be provided, in accordance with 521 CMR 10.3, *Parking Spaces for Dwelling Unit Occupants*.

T35. Include swept path analysis on Site Plans to ensure Municipal Fire vehicles can adequately maneuver the Site.

If we can be of any further assistance regarding this matter, please contact us at our office.

Very truly yours,
BETA Group, Inc.

Greg Lucas, PE, PTOE, RSP
Senior Associate