

April 5, 2021

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

**Re: 1165R Mass Ave Apartments – Arlington, MA
Traffic Comment Response Review**

Dear Ms. Raitt:

BETA Group, Inc. (BETA) has reviewed Applicant's Comment Responses, dated March 9, 2021, and subsequent revised Traffic Impact Report (and Appendix), dated March 9, 2021, for the proposed multi-unit housing redevelopment of the 1165R Massachusetts Avenue parcel (the Site) within the Mirak Innovation Park in the Arlington Heights neighborhood. This letter is provided to outline BETA's comments, *Applicant's responses, and any follow-up comment.*

SITE ACCESS, CIRCULATION, AND PARKING

- T1. Clarify how these signs will be implemented. Site Plans do not propose any changes for the Massachusetts Avenue driveway.
The wayfinding signage has been included in the revised Site Plan package. See attached.
Revised Site Plan package was not provided for review.
- T2. The Site Plan shows DO NOT ENTER markings for the Ryder Street Driveway, suggesting a one-way "Exit Only" condition. This is not replicated on Architectural Plans.
The Architectural Plans depict design within the building and does not represent access to the site. The Site Plan depicts everything on-site, including access signage and markings, outside the building footprint. Therefore, it is not expected that access will be replicated on the Architectural Plans. See comment response R1.
Updated Site Plans were not provided for review. Verify one-way or two-way configuration of the Ryder Street driveway.
- T3. Garage parking aisles appear to be less than the required 24-foot width in some instances.
The developer has applied for a waiver from the Town requesting that aisle width be reduced to 23.5 feet for two-way traffic.
The vehicle maneuver drawings suggest vehicles will strike support columns or walls, and will likely require vehicles to swing into adjacent parking spaces to adequately make a parking maneuver. A waiver to reduce aisle width is not recommended. Recommend maximizing the aisle width to accommodate multiple point turns to access parking without striking other vehicles, columns, or walls.
- T4. Clarify that vehicles can maneuver within the parking garages, including usage of the ramp and maneuverability for parking stalls closest to the entrance at Building 4.

The turning maneuver plans have been included in the Architectural Plans which shows turning maneuver paths for the ramp and parking stalls for the parking garages. See attached.

See Response T3. Turning maneuver drawings suggest vehicles will strike support columns or walls, and will likely require vehicles to swing into adjacent parking spaces to adequately make a parking maneuver. The tight garage will require multiple point turning maneuvers to safely access a space. This is more severe for spaces adjacent to end walls as shown on the turning sketches.

- T5. Clarify whether parking garage will be gated and how access will be managed for tenants and Workbar tenants.

The parking garage is not intended to be gated. Access will be managed by an on-site property manager. It is anticipated that all parking spaces will be numbered and that all Workbar tenants and residents will have a form of identification (such as a parking sticker or tag) designated reserved and non-reserved spaces within the garage. Resident parking spaces will be leased at market rates.

This practice will discourage some residents from owning a vehicle, thereby reducing the parking demand. Denote space numbering on the Site Plans.

- T6. Clarify whether garage parking will be deeded per unit.

The parking spaces will not be deeded per unit.

See Response T5. No further response required.

- T7. Clarify which spaces will be designed for Workbar tenants. Given the tight maneuvering spaces within the garages, these spaces should be accessible for higher turnover activity.

The designated Workbar spaces will be located closest to entry of the garage.

See Response T5. Denote space numbering and designated Workbar spaces on the Site Plans.

- T8. While peak Workbar activity is expected during normal business hours, it is noted that Workbar provides 24/7 access to members.

The project incorporates a shared parking plan with the Workbar owner to provide 40 Workbar parking spaces during weekday work hours and 10 Workbar parking spaces during nights and weekends in the garage.

No response required.

- T9. One accessible parking space is provided per the Site Plans within the "Short Term" parking area. This is not represented in the Architectural Plans. Zero accessible spaces are provided in the parking garages. Confirm the adequacy of the provided accessible spaces and define adequate accessible routes to both residential and the Workbar.

The "Short Term" parking space is located outside the building, so it is represented on the Site Plans. The architectural plans show accessible parking spaces within the garage. See attached.

There are two attached interior garage plans. Both show a different parking configuration. One displays the location of accessible spaces, and the other plan shows vehicle turning paths with zero accessible spaces. BETA recommends the Applicant team coordinate and provide a consistent Site Plan.

Building 4 is shown as providing two accessible spaces on each level (4 total) adjacent to the entry to Building 1 and a bank of elevators.

Building 2 is shown to have 1 accessible space adjacent to an elevator. This is acceptable, but will require an awkward move to exit the space which may not be possible/easy depending on the physical restrictions of the driver.

The exterior Site Plan shows one accessible space within the Short Term Parking area between Building 1 and Building 4. This is acceptable.

TRAFFIC IMPACT REPORT REVIEW

STUDY AREA

- T10. Forest Street is classified as a collector roadway.

The classification has been updated in the TIR.

Issue resolved.

- T11. The intersection of Massachusetts Avenue at Appleton Street and Appleton Place provides a pedestrian activated traffic signal that operates under “flash” when not activated and steady “yellow/red” with “Walk/Don’t Walk” when activated. Per section 4E.06 of the MUTCD, pedestrian signal heads shall not be displayed when the vehicular traffic control signal is being operated in the flashing mode.

As described in Section 2.2 of the revised TIR, Nitsch understands the signal provides a pedestrian activated traffic signal that operates under “flash” when not activated and steady “yellow/red” with “Walk/Don’t Walk” when activated. The intersection effectively operates as an unsignalized intersection. Although the traffic signal does not meet current federal regulations stated in the Manual of Uniform Traffic Control Devices (MUTCD), there is no current plan by the Town to revise the traffic signal.

No response required. It should be noted that the Arlington Select Board has convened a design review committee to study and make recommendations at this intersection.

PEDESTRIAN AND BICYCLE FACILITIES

- T12. Recommend the Applicant summarize the condition of nearby pedestrian and bicycle facilities and specify if improvements are required to safely accommodate added non-motorized traffic to/from the Site.

Section 2.1 of the initial TIR identifies pedestrian and bicycle facilities and summarizes the condition along each roadway. Specifically, the sidewalks to be used as a pedestrian path to the site, which include Massachusetts Avenue, Forest Street, and Ryder Street, are all in good to fair condition. All other bicycle facilities, including the Minuteman Commuter Bikeway and the Massachusetts Avenue bicycle pavement also appear to be in good condition.

See Response T28.

TRAFFIC COUNT DATA

- T13. The evening peak hour ATR volumes for Massachusetts Avenue could not be validated and appear low. Review and revise accordingly.

The ATR volumes presented in the report have been reviewed and verified that they match the data collection.

Comment stands. The data suggests a peak hour for Mass Ave of 5:00-6:00 PM with a volume of 1,086 (seasonally adjusted per the TIR) with 56% Eastbound.

- T14. Backup ATR volume sheets for Burton Road show zero volume over the course of the day. Review and provided updated sheets as appropriate.

See the attached revised ATR volume sheets for Burton Road that have been included in Appendix A of the revised TIR.

ATR volume sheets were provided. No further comment.

PARKING

- T15. It is generally assumed that the parking assessment was conducted in 2020.

That is correct. The parking assessment year has been identified in Section 3.3 of the revised TIR.

Section 3.3 does not appear to have been updated accordingly. This is not a detrimental issue.

- T16. Backup information for the parking assessment was not provided in the Appendix.

Further backup information has been provided in Appendix C of the revised TIR.

Backup provided. The peak period for the existing parking lot occurs during the lunch hour. No further comment.

- T17. Clarify the occupancy of the Mill Building Office Space. Existing Site Plans show the Mill Buildings to be larger than 17,000 square feet. Should the building not be fully utilized, the parking demand would be lower, suggesting a higher proportion of Workbar usage.

Through discussions with the project owner, it has been determined that the approximate 17,000 square-foot office space is fully occupied. Therefore, the parking demand calculated for the Workbar is still valid.

Revised TIR and response does not adequately address original comment. Occupied space of the Mill Building and Workbar should be identified. Workbar parking demand can be estimated as the percentage of Workbar occupied space compared to total occupied space utilizing the existing parking area. This derivation of site specific parking data can be assumed to be more representative of the site than calculations using ITE rates and mode share data. Occupancy data should match the time period when parking utilization data was collected.

- T18. The text and footnote on page 16 of the TIR references *Trip Generation, 10th Edition* instead of *Parking Generation, 5th Edition*.

This reference has been updated in the revised TIR.

Issue resolved.

- T19. The parking observations were conducted at different times on different days. The Legacy at Arlington Place (lowest ratio, 0.34) was conducted on a Saturday throughout the morning and mid-day hours, while the Arlington 360 (highest ratio, 0.76) was conducted in the mid-day hours on a weekday. The ITE *Parking Generation* rate for bedrooms is 0.75 on weekdays and 0.77 on weekends. This is more consistent with that observed at the Arlington 360 complex.

The ITE Parking Generation rate is an average based on national studies and, therefore, should be used only as a guideline. To understand the local parking utilization for this specific use, a detailed parking study was deemed necessary. Therefore, the average parking utilization of 0.55 spaces per bedroom calculated from all three comparable housing developments (The Legacy at Arlington Center, Brigham Square Apartments, and Arlington 360) was used to justify the parking demand at the 1165R Mass Ave Apartments development. The following is a summary of when we collected applicable data.

- *Brigham Square Apartments at 30 Mill Street on Wednesday, January 29, 2020 from 6:00 AM to 8:00 AM and 12:00 to 2:00 PM, on Thursday January 30, 2020 from 6:00 PM to 8:00 PM, and on Saturday, February 1, 2020 from 9:00 AM to 11:00 AM.*
- *Arlington 360 at 4205 Symmes Circle on Thursday, January 30, 2020 from 12:00 PM to 2:00 PM; and*
- *The Legacy at Arlington Center at 438 Massachusetts Avenue on Saturday, February 1, 2020 from 9:00 AM to 2:00 PM.*

To obtain the peak parking demand at the other developments in addition to our own on-site observations, the management companies were contacted to obtain parking information, including the total number of spaces provided and the number of spaces reserved. As shown in Table 4 of the TIR, the Brigham Square Apartments is most representative of the proposed development, as it is similarly located in proximity to Massachusetts Avenue and the Minuteman Commuter Bikeway and has a similar number of bedrooms. Although the parking utilization for the Brigham Square Apartments is also directly in line with the average, it was necessary to show that we studied other developments as well.

Further clarification is necessary regarding BETA's comment, along with additional commentary based on revised TIR and Appendix.

- 1. Utilization rates collected at different times of day do not adequately predict peak parking utilization. A meaningful average cannot be calculated from data collected at different times of day.**
- 2. Times of day for Arlington 360 and The Legacy at Arlington Center do not match backup materials, which state that parking lot security restrictions prevented collection of complete counts. Clarify how peak utilization rates were determined for these sites – was peak utilization manually confirmed, or provided by facility management? What time of day was said utilization collected?**
- 3. Table 4 is included in a section of the TIR discussing mid-day parking demand in order to develop a conclusion on the relationship between mid-day residential parking demand and the need to provide dedicated spaces for Workbar tenants. As such, the summary should review data from comparable sites during the mid-day period. Mid-day data is provided for Brigham Square apartments, which shows a mid-day peak of 71 spaces occupied, for a rate of 0.61 spaces/unit or 0.40 spaces/bedroom.**
- 4. See response T32 for further discussion on peak residential parking demand.**

T20. BETA generally concurs that parking demand would be lower with adequate connections to the commuter bikeway and the MBTA.

No Response Required

As noted in the Arlington Transportation Advisory Committee's memorandum dated March 11, 2021, the MBTA has proposed service cuts to the area which include reduced

MBTA bus service along Massachusetts Avenue. This will increase the desire for on-site parking.

SAFETY EVALUATION

- T21. The TIR summarized crash data for 2018 and 2019, year which were not “closed” by MassDOT. This suggests that the data may not be complete. As of writing this letter, 2018 data is now finalized (“closed”). Typically, it is recommended to summarize the three most recent “closed” years.

Nitsch has reviewed and summarized “closed” crash data for the most recent three years for 2016 to 2018. The crash numbers and rates have been adjusted accordingly in the revised TIR and are considerably less than previously reported.

The crash data updates are acceptable. No further comment.

- T22. BETA ran crash summaries for the study area intersections and found crash totals to be inconsistent from those presented in the TIR. Crash data backup was not provided in the TIR Appendix for reference. Recommend providing backup in the Appendix to support the table.

Nitsch has found that the previous collected data has duplicate entries making the total number of crashes much higher than expected. As also mentioned in T21, the “closed” crash data was used in the revised TIR. There are 8 total number crashes presented in the revised TIR as compared to 34 reported in the previous TIR. The new crash data, rates, and diagrams are presented in Appendix D of the revised TIR.

The crash data updates are acceptable. No further comment.

- T23. As noted in Comment T22, it is expected that the crash history for Forest Street at Ryder Street/Peirce Street is overstated and not representative of existing conditions. Reevaluate and revise as appropriate.

Nitsch has reviewed the crash rate for all intersections, including Forest Street at Ryder Street/Peirce Street, which was higher due to the duplicate crashes. Nitsch has corrected the crash rate from 1.59 to 0.13 crashes per MEV.

The crash rate updates are acceptable. No further comment.

- T24. The notes for Table 6 of the TIR are not representative of the text and data presented in the TIR and Table.

A total of 8 crashes were reported within the study area from 2016 to 2018. There were no reported crashes at the intersections of Massachusetts Avenue and Quinn Road, Mirak Innovation Park West Driveway and Quin Access Road, and Ryder Street and Mirak Innovation Park Ryder Street Driveway during the study period. In terms of severity, one (1) crash in the study area reported personal injury, four (4) crashes are reported as property damage only, and there were no crashes with fatalities. Angle and sideswipe crashes were the most frequent type of crash with a total of 3 crashes each, and of the remaining crashes, 2 were rear-end crash. No crashes involving pedestrians or bicycles were reported. Twenty-five percent of all crashes in the study area occurred during peak hours, and 25% of all crashes occurred under wet/icy conditions. Nitsch also updated the Table 6 notes that used to say, “Based on 3-year crash history from MassDOT, 2014-2016” to “Based on 3-year crash history from MassDOT, 2016-2018” and “Based on latest MassDOT crash data queried June 2018” to “Based on latest MassDOT crash data website.”

The Crash Data section has been updated.

BETA notes that the Table 6 Note “c” has not been fully updated in accordance with the response to comment. It still references “June 2018” which is not reasonable for this project.

SIGNAL WARRANT ANALYSIS

- T25. While the Project may not significantly increase traffic volumes through these intersections, activity will increase when accounting for increased vehicle, pedestrian, and bicycle travel to/from the Site. Recommend the Applicant offer safety related recommendations to improve conditions.

As noted in Section 4.2 of the revised TIR, the Proponent recognizes safety is an issue through the study intersections. However, they do not intend to provide infrastructure improvements, as the project will not significantly impact the roadway network. Since the initial submission of the TIR in July 2020, the Town has been working with a traffic consultant to conduct a Road Safety Audit to evaluate the intersections and determine the most appropriate mitigation measures.

No response required.

FUTURE NO-BUILD TRAFFIC CONDITIONS

- T26. Figure 5 (2025-No-Build Peak Hour Volumes) of the TIR was found to have misrepresented volumes for some turning movements. In one intersection, volumes decreased when compared to the existing conditions. These discrepancies are not expected to dramatically change the conclusions of the report.

After thorough review of both Figure 3 (2020 Existing Peak Hour Volume) and Figure 5 (2025 No-Build Peak Hour Volume), Nitsch found the discrepancy at the intersection of Peirce Street, Ryder Street, Forest Street, and Driveway, and we have rectified the volume. As noted, the changes are minor and do not significantly change the traffic analysis presented in the initial TIR.

Figures updated. No further comment.

PROPOSED FUTURE CONDITIONS

- T27. Site access is to be provided via Quinn Road and the access road between Quinn Road and the site. Although these roadways exist today, they essentially serve as local access to abutting businesses, including Mirak Chevrolet, DeVito Funeral Home, and service facilities for Mirak Chevrolet and Mirak Hyundai. The Mirak Chevrolet dealership has head-in parking along the building with direct entry from Quinn Road. Provide commentary on how additional site-generated traffic will impact access and operations to Mirak Chevrolet and DeVito Funeral Home, and whether additional measures are necessary to accommodate, restrict, and/or delineate parking along Quinn Road serving both abutting businesses.

Given the low volume of site-generated traffic, especially during the midday hours, access and operations for the abutting businesses will not be significantly impacted. During the weekday midday hours when the abutting business are expected to be at a peak, the new development is expected to generate on average 35 vehicles per hour, or approximately 1 vehicle every 2 minutes. This is not deemed to be a significant amount of traffic affecting access or operations on-site and off-site. Furthermore, adequate wayfinding signage will be provided directing Workbar vehicles to the designated parking areas, and residents will be

under a contractual agreement stating that parking will be allowed only within the designated parking garages.

Provide proposed signage and any recommended revitalization (repaving, striping, sidewalk, etc.) to Quinn Road and the surrounding driveways to reduce the amount of vehicle, pedestrian, and bicycle conflicts.

PEDESTRIAN AND BICYCLE ACCOMMODATIONS

- T28. See Comment T12. Off-site multimodal improvements should be considered to promote connectivity to Mass Ave and to the Minuteman Commuter Bikeway.

Adequate connections to the pedestrian and bicycle pathways currently exist. Further, sufficient on-site bicycle parking is provided at the project, and a robust Transportation Demand Management Program will be implemented to promote more use of bicycles and help reduce the single occupancy vehicles for short distance commutes.

We disagree with the assessment that “adequate” connections currently exist. The Mirak Innovation Park West Driveway and Quinn Road are effectively parking lot driveways and do not provide any pedestrian or bicycle accommodations, which would require pedestrians and bicycles to travel with traffic and motor vehicle parking maneuvers. The Mirak Innovation Park West Driveway features a utility pole, located within the travel way. This pole should be relocated. Ryder Street also serves on-street parking and off-street parking for abutting uses. A short section of sidewalk is provided south of the Site Driveway, but no accommodation is provided north to the bikeway. This would also require pedestrians and bicycles to walk/ride in the travel way and avoid parking maneuvers. As Ryder Street is a private way south of the Project to Massachusetts Avenue, consider repaving or supporting maintenance efforts to improve conditions along this roadway.

TRIP GENERATION

- T29. Backup calculations for Trip Generation were not appended for reference. Calculations for the Office use appear to utilize the “Peak Hour of Generator” which generates a larger number of trips than the “Peak Hour of Adjacent Street.” This represents a larger existing credit for proposed trips; recommend using “Peak Hour of Adjacent Street”. The calculations for housing trip generation could not be verified. Provide calculation backup for review.

The trip generation calculations for the office were calculated using the “Peak Hour of the Adjacent Street.” The trip generation rates for LUC 710 – General Office Building are similar when comparing “Peak Hour of Generator” and “Peak Hour of Adjacent Street.” Therefore, we see how there was a misunderstanding. The ITE trip generation worksheets are provided in Appendix F for the revised TIR.

Review of the backup information shows the Applicant estimated the number of generated “Person” trips, which represents a larger number than the estimated “Vehicle” trips. This is expected as “Person” trips include all other modes in addition to driving, walking, bicycling, transit, etc. Since the Applicant’s Traffic Impact Report assumed a vehicle occupancy rate of 1.0 persons per vehicle, this methodology is conservative. No further comment.

MODE SHARE

T30. Suggest using Census Tract data for application of mode share to determine vehicle trips. Census data is more recent than the 2015 Master Plan and suggests a 7% increase in car trips when compared to the TIR.

Nitsch has reviewed the 2019 Census Tract data as a source of overall mode share within the project region. However, an appropriate adjustment still has be made to account for the proximity to the Minuteman Bikeway and public transit. The Census Tract data and the project specific mode-share are as follows:

Mode	Master Plan	TIR	Census Tract 3566.01	Revised TIR
Car	72%	67%	74%	69%
Transit	17%	19%	21%	21%
Bike	2%	5%	1%	3%
Walk	3%	3%	2%	2%
Taxi	1%	1%	0%	1%
Work From Home	5%	5%	2%	4%

The intention of the Census Tract information is to provide hyperlocal mode splits more consistent with the evaluated region/neighborhood. The Census Tract data should already represent the presence of the bike path and its effect on commuting to/from the MBTA station or other area uses. The Revised TIR decreased the Census Tract “Car” percentage by 5% and subsequently increased the Bike (2%), Taxi (1%), and Work From Home (2%) percentages. Increasing Taxi and Work From Home decrease the personal vehicle trips, but does not account for the “proximity of public transit and the bikeway.”

It should be noted that Census mode share data is based on the mode used for the longest distance on a trip. As a result, a trip where a resident uses their car to drive to Alewife and take the Red Line would be reported as a transit trip. Provide an assessment of this potential for increased car trips.

TRIP ASSIGNMENT

T31. Clarify one-way or two-way operation of site driveways. See comments T1 and T2.

The future site access for tenants of the Workbar and apartments is as follows:

- *Mirak Innovation Park west driveway will be ingress only;*
- *Ryder Street south driveway will be egress only; and*
- *Quinn Road will be two-way.*

This is represented on the Site Access Diagram (Figure 6). Access and operations will remain as existing for the abutters.

Recommend site access and circulation signage and markings be displayed on the Site Plan. Figure 6 shows two way “abutter site access” via the Mirak Innovation Park west driveway; clarify how resident access will be restricted while abutter access is allowed.

PARKING GENERATION

- T32. The 0.55 spaces per bedroom rate presented in Section 3.3 of the TIR does not definitely represent peak parking utilization of the three nearby complexes. Only one (Brigham Square Apartments) was counted at night, with the count ending at 8:00 PM. A count to determine peak parking utilization should be conducted during the late night or overnight hours. Recommend counting after 10:00 PM on a day other than Friday or Saturday. Demand rates should also consider if there are any vacant apartments at the comparable sites during the data collection period.

Brigham Square Apartments was the only complex that had attainable data during all count periods: weekday morning, midday, and evening, and Saturday mid-morning. In addition to our own on-site observations, the complex management companies provided the number of reserved and non-reserved spaces occupied on record. The apartment mix, peak utilization, and total parking lot spaces information obtained from the management companies was used to derive the project parking demand for comparable use. The apartment complexes chosen for the study are ones of similar size and proximity to public transit. At the time of the counts, vacancy rates for the developments ranged from 0-3%.

The intention of the comment relates to peak parking demand observed in the overnight hours when the majority of residents/tenants can be expected to be home and sleeping with vehicles parked on-site. As the residential component will be the primary land use, it will consume the most parking. It is expected that parking demand will be lower during the day as residents leave for their workplace. It is possible that the nearby sites were less utilized during the day but overfilled during the night time, suggesting a higher parking ratio for this development. It is essential to compare sites during the known peak utilization period.

- T33. Assuming an ITE Parking Generation based on Dwelling Units, the estimated parking demand would be 170 parking spaces. This is more consistent with that of the zoning by-laws. The by-laws do allow for a reduction in parking, provided adequate measures are provided to reduce personal vehicle reliance.

ITE Parking Generation calculates demand ratios based on national studies for similar uses of similar size. However, it was determined by the project team that the zoning code and ITE over-represent what will be required for this site, which is why we conducted the robust parking utilization study. The study concluded that the maximum required parking for the development is 107 parking spaces. The proponent is seeking a waiver from the municipal standards for parking ratios.

BETA concurs that utilizing similar local sites is an accepted industry practice for determining projected parking demand. See Response T32.

- T34. Clarify the derivation of the 85% factor applied to weekday mid-day parking occupancy in Table 12.

Based on our own on-site observations in addition to the information provided by the property management companies, it was originally calculated that the weekday midday parking occupancy represented 85% of the parking occupancy. Upon further review of the data, a more accurate representation of the weekday midday occupancy is 82% of the peak occupancy. Therefore the 82% now shown in Table 12 represents the percentage of peak

occupancy during the weekday midday period. Parking occupancy calculations have been included in Appendix C of the revised TIR.

The parking information obtained at the Brigham Square Apartments showed a peak weekday parking demand of 99 vehicles at 6:30 AM (65% of the 153-space parking lot). This was compared with the maximum weekend parking demand of 85 vehicles at 9:00 AM (46% of the 153-space parking lot) and the maximum weekday midday demand of 71 vehicles at 12:30 PM (56% of the 153-space parking lot). This found the weekday midday peak has 18% less demand, and the weekend has 9% less demand. than the larger weekday peak at 6:30 AM. At issue is whether the 99 vehicles in the early weekday morning accurately represents peak demand, see Response T32. It is expected that peak demand would be higher in the overnight hours. A peak parking demand of 65% seems unreasonable and suggests that the nearby apartment complex provides over 50 parking spaces that are unused. Peak parking rates should be reviewed for all three comparable sites to verify the relation between mid-day and peak demand.

- T35. The peak parking rate for Arlington 360 was determined as 0.76 spaces per bedroom during a weekday mid-day. Application of this rate to the Project Site would result in a weekday mid-day demand of 142 spaces for residents alone, before considering the 40 spaces to be designated for Workbar tenants, which would result in a need for 182 parking spaces. Provide commentary clarifying why demand characteristics of the Project Site will differ from those of Arlington 360 or other comparable sites. Even at a rate of 0.55 spaces per bedroom during mid-day hours, the 103 space demand stated in the TIR plus the 40 spaces designated for Workbar results in a net deficit of 7 spaces.

As shown in Table 4 of the TIR, the Brigham Square Apartments is most representative of the proposed development, as it similarly located in proximity to Massachusetts Avenue and the Minuteman Commuter Bikeway and has a similar number of bedrooms. In addition, the Project parking garage will function the same as the Brigham Square Apartments garage; a shared lot with reserved and non-reserved parking. Therefore, utilizing the 0.55 spaces per bedroom would most accurately model the anticipated parking utilization for the 1165R Mass Ave Apartments. Note, the 0.55 spaces per bedroom is the calculated average rate for all apartment complexes but is also the exact rate calculated for the Brigham Square Apartments.

Backup parking information suggests a parking study was only performed for the Brigham Square Apartments which recorded parking demand (parked vehicles) in half hour intervals during the above mentioned time periods. The other two apartment complexes could not be observed due to security reasons. The parking demand reported for these complexes were obtained from Management which includes one peak demand number. It is unclear when this peak demand actually occurred and what it includes. While it can be assumed that the Brigham Square Apartments are an adequate representation, it would be helpful to have adequate data for all three comparable sites. See Response T32.

CONSTRUCTION MANAGEMENT

- T36. A construction management plan should be provided for review.
A Construction Management Plan will be provided by the Project in later phases of the project permitting.

The Plan should be provided for Town and BETA review. It is important to consider the traffic impact of construction vehicles.

TRAFFIC OPERATIONS

- T37. Recommend these calibrations stay consistent for all conditions (existing, no-build, and build) to accurately represent the change in delays and queues as a reflection of changing volume.

Nitsch has revised the Synchro analysis and updated the critical gap times where applicable.

Issue Resolved.

- T38. Verify how the delays and LOS were combined for the five-legged intersections. It is expected that the delays were summed among common movements, though the reported values in Table 14, Table 15, and Table 16 do not match those reported in the Appendix. This is more specific to the morning peak hour analysis.

Given the limitations in the Synchro 10 traffic modelling software, a five-legged, unsignalized intersection is not possible to model as a single intersection. Therefore, the two five-legged intersections were each modeled as two smaller, separate intersections (nodes) and combined.

For each of the five-legged intersections, we determined a logical grouping to model the two nodes. At the intersection of Massachusetts Avenue and Appleton Street/Appleton Place/Commercial Driveway, we modeled Appleton Street and Appleton Place separately from the two legs of Massachusetts Avenue and the Commercial Driveway, with a short, imaginary roadway segment connecting them. Likewise, at the intersection of Massachusetts Avenue and Forest Street/Burton Street/Mirak Innovation Park West Driveway, we modeled the west leg of Massachusetts Avenue, Forest Street, and Burton St separately from the east leg of Massachusetts Avenue and Mirak Innovation Park West Driveway, with a short roadway segment connecting them, mimicking the actual layout.

Each movement across the overall intersection requires a movement at one or both of the nodes. To calculate the average delay for each approach across the full intersection, we performed the following steps:

- 1. Multiply the average delay on Approach A from the Synchro output for the associated node by the number of vehicles on Approach A, which gives the total delay on Approach A attributable to movements at only that one node.*
- 2. For the overall movements on Approach A that involve the other node, multiply the average delay on the associated approach at the other node by the number of vehicles making those movements from Approach A, which gives the total delay on Approach A attributable to movements at the other node.*
- 3. Add the two total delay numbers together to get the total delay on Approach A through the full intersection.*
- 4. Divide the total delay on Approach A through the full intersection by the number of vehicles on Approach A to get the average delay per vehicle on the approach.*

The calculations are included in Appendix G of the revised TIR.

BETA reviewed the above discussion and the calculation tables in the Appendix. The described methodology is acceptable. No further comment.

- T39. The reported Operations Summary Tables were found to vary slightly from results presented in the Appendix. The discrepancies are unclear, but generally do not affect the conclusions as reported.

Nitsch has reviewed the discrepancies. These were the result of the five-legged calculation methodology explained in T38. The calculations to obtain the results are in Appendix G of the revised TIR.

For all AM Peak Hour analysis conditions, the southbound Commercial Driveway at Mass Ave and Appleton Street should be reported as LOS A as there is no existing or proposed volume for this driveway during the AM Peak Hour.

- T40. There are two missing 2025 Build Analysis worksheets in the Appendix. Provide for reference.

The worksheets are included in Appendix G of the revised TIR.

Worksheets were provided in Appendix H. No further comment.

TRANSPORTATION DEMAND MANAGEMENT (TDM)

The Project is intended to provide on-site supply of transit information as well as develop a TDM plan in accordance with the Town. The following are proposed examples of TDM measures:

- Provide Orientation Packets to tenants and residents
- Provide interior and exterior bicycle storage, and repair workstations
- Explore electric vehicle charging stations
- Explore providing shared car service (e.g. zipcar)
- Establish a transportation coordinator
- Develop a Project website to disseminate information
- Develop a Transportation Monitoring Program to evaluate the TDM's effectiveness

BETA supports the development of a successful TDM. Coordination should be provided with the Town regarding implementation.

GENERAL COMMENTS

T41. A sight distance evaluation should be provided.

As all site driveways are to remain at the existing locations, a sight distance evaluation was not deemed necessary for this report.

Use of existing roadways does not guarantee adequate sight distance. Existing sight distance should be evaluated. As part of the Site Design, explore methods to maximize sight lines.

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



Tyler de Ruiter, PE, PTOE
Senior Project Engineer

cc: Douglas W. Heim, Arlington Town Counsel
Job No: [7470]