Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Ref: 9448

September 27, 2022

Ms. Darlene Wynne, AICP
City of Beverly
Director of Planning & Community Development
191 Cabot Street
Beverly, MA 01915

Re: Traffic Engineering Peer Review
Proposed Mixed-Use Development - 218-224 Cabot Street and 18 Federal Street
Beverly, Massachusetts

Dear Ms. Wynne:

Vanasse & Associates, Inc. (VAI) has completed a review of the materials that have been submitted on behalf of Leggat McCall Properties, LLC (the "Applicant") in support of the proposed redevelopment of the existing commercial property located at 218-224 Cabot Street and 18 Federal Street in Beverly, Massachusetts, to accommodate a new mixed-use building (hereafter referred to as the "Project"). Our review focused on the following specific areas as they relate to the Project: i) vehicle and pedestrian access and circulation; ii) Massachusetts Department of Transportation (MassDOT) design standards; iii) City Zoning requirements as they relate to access, parking and circulation; and iv) accepted Traffic Engineering and Transportation Planning practices. The Applicant has submitted the following supporting materials which are the subject of this review:

1. *Site Plan Review Application,* 218-224 Cabot Street and 18 Federal Street (Leggat McCall Properties LLC); Glovsky Counselors-at-Law; June 13, 2022, with accompanying narrative and supporting attachments;

2. *Permit Site Plan* (To Accompany a Request for Site Plan Review), 218-214 Cabot St and 18 Federal St, Beverly, MA 01915; Hancock Associates, et al; June 10, 2022, no revisions (the "Site Plans");

3. *Traffic Impact and Access Study*, Mixed-Use Redevelopment, 218-224 Cabot Street – Beverly, Massachusetts; Greenman-Pedersen, Inc. (GPI); July 12, 2022 (the "July 2022 TIAS"); and

4. Response to Comments from Traffic & Parking Commission, Mixed-Use Redevelopment, 218-224 Cabot Street – Beverly, Massachusetts; GPI; September 6, 2022.

In addition, VAI reviewed the site locus in order to validate the existing conditions context of the Project and to observe factors related to the design and location of the access to the Project site, internal circulation and potential off-site improvements.

July 2022 TIAS

T1. A review of the MassDOT High Crash Location (HSIP) database should be undertaken in order to determine if there are designated located within the study area. Our review indicates that the following intersections have been designated as high crash cluster locations for the 2017-2019 reporting period:

- Cabot Street/West Dane Street/Dane Street
- Cabot Street/Pond Street/Winter Street/Knowlton Street

Just outside of the study area, the Federal Street/Park Street intersection is also listed as a high crash cluster location. Specific recommendations should be provided to advance safety-related improvements at locations where the calculated crash rate exceeds the MassDOT average crash rate and/or the intersection is listed as a high crash location.

T2. A sight triangle plan should be prepared for the Project site driveway intersections that illustrates the sight distance for: i) a driver exiting the garage to a pedestrian in the sidewalk; and then ii) for a driver exiting the driveway assuming that the vehicle occupies the sidewalk area. The sight triangle plan should consider the building wall location for the sight lines to a pedestrian and the presence of on-street parking along Chapman Street for the final exit maneuver.

T3. The Applicant should commit to implementing the pedestrian mobility improvements at the Cabot Street/ Wallis Street intersection, the sidewalk improvements that were identified along Bow Street and the fire truck maneuverability improvements at the Chapman Street/Bow Street intersection.

In addition, consideration should be given to advancing pedestrian safety improvements at the following intersections to include the installation of pedestrian crossing warning signs, reconstruction of wheelchair ramps where necessary to meet ADA requirements and reapplication of crosswalk pavement markings where faded:

- Cabot Street/Bow Street/Abbott Street
- Federal Street/Chapman Street
- Chapman Street/Bow Street

Site Plans

S1: The garage doors should be recessed within the building so that a queued vehicle entering the garage does not extend into the traveled-way along Chapman Street. The design of the garage entrance and door location should be informed by the sight distance analysis requested in Comment T2.

S2: The garage doors appear to be 18 feet in width and would do not allow for two-way traffic. The garage doors and the driveway openings leading to the doors should be increased to 20-feet in width.

S3: The Applicant should verify if on-street parking along Chapman Street will be removed or modified to accommodate access to the Project site. These modifications should be reflected on the Site Plans along with the requisite regulatory signs.

S4: The sight triangle areas for the Project site driveways should be shown on the Site Plans along with a note to indicate: "Signs, landscaping and other features located within sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5-feet in height. Snow accumulation (windrows) located

within sight triangle areas that exceed 3.5-feet in height or that would otherwise inhibit sight lines shall be promptly removed."

S5: A note should be added stating: "All Signs and pavement markings to be installed within the Project site shall conform to the applicable specifications of the Manual on Uniform Traffic Control Devices (MUTCD)."

S6: A narrative should be provided that describes how tenant moves and loading and delivery activities for the commercial tenants will be managed. The narrative should include the locations where vehicles associated with these activities will be accommodated.

S7: A vehicle turning analysis should be provided using the AutoTurn© software for a service/delivery/moving vehicle (SU-30 or SU-40 design vehicle). The turning analysis should depict all maneuvers required to access the required areas defined as a part of the narrative requested in Comment S4, including the pick-up of trash/recycling.

S8: The parking spaces at the end of each row of parking are only accessible by backing into the spaces. A vehicle turning analysis should be performed for each end parking space to demonstrate that sufficient maneuvering area is available. This analysis should be performed using the AutoTurn© software for a passenger car design vehicle (P design vehicle, 19-feet in length).

Parking

P1: The number of tandem parking spaces that are provided within the residential parking garage should be clarified. Ground Floor Plan A1.01 appears to indicate that 32 tandem parking spaces are provided.

P2: The parking space assignment within the residential parking garage should be defined. The tandem parking spaces will need to be assigned to the two bedroom units.

P3: A narrative describing the access controls or restrictions that will be used for the Chapman Street/Federal Street surface parking lot should be provided.

This concludes our review of the materials that have been submitted to date in support of the Project. If you should have any questions regarding our review, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk

Jeffrey S. Dirk, P.E., PTOE, FITE
Managing Partner

Professional Engineer in CT, MA, ME, NH, RI and VA

JSD/jsd

TRAFFIC ENGINEERING PEER REVIEW
PROPOSED MIXED-USE DEVELOPMENT
218-224 CABOT STREET AND 18 FEDERAL STREET
BEVERLY, MASSACHUSETTS
SEPTEMBER 27, 2022

The following details Vanasse & Associates, Inc.'s (VAI's) review of the July 2022 *Traffic Impact and Access Study* (the "July 2022 TIAS") and the subsequent September 6, 2022 *Response to Comments from Parking & Traffic Commission* letter (the "September 2022 RTC") prepared by Greenman-Pedersen, Inc. (GPI), and the June 10, 2022 *Permit Site Plan* prepared by Hancock Associates, et al (the "Site Plans"), in support of the proposed redevelopment of the existing commercial property located at 218-224 Cabot Street and 18 Federal Street in Beverly, Massachusetts, to accommodate a new mixed-use building (hereafter referred to as the "Project").. Our comments are indicated in *italicized* text, with those requiring responses or additional information ***bolded***.

PROJECT DESCRIPTION

The Project will entail the redevelopment of the commercial properties located at 218-224 Cabot Street and the municipal parking lot located at 18 Federal Street in Beverly, Massachusetts, to accommodate a mixed-use development. The subject properties along Cabot Street currently consist of a one to two-story commercial building that includes 17,500 square feet (sf) of restaurant/retail space on the ground floor and 6,000 sf of office space on the second floor. In conjunction with the Project, the one-story portion of the existing commercial building to the rear of 218-224 Cabot Street will be demolished, a new five-story multifamily residential building with 113 residential units will be constructed, and the existing storefronts along Cabot Street will be renovated to encompass 5,000 sf of street-level retail/restaurant space. The new residential building will extend over the municipal parking and will include four residential floors over a podium, with the first floor consisting of ground level parking. The second floor of the existing commercial building that fronts along Cabot Street will be renovated to support six (6) multifamily units which are included in the 113 total residential units.

Access to the parking garage will be provided by way of two (2) new driveways that will intersect the east side of Chapman Street approximately 85 feet north of Bow Street and 30 feet south of Federal Street, respectively. The existing driveways that serve the municipal parking lot that intersect Chapman Street and Federal Street (two (2) driveways) will be closed.

On-site parking will be provided for 153 vehicles to support the residential use, including three (3) handicapped accessible parking spaces and 20 tandem parking spaces, four (4) of which are compact parking spaces. Additional parking for residents will be provided in an existing surface parking lot that is located on the southwest corner of the intersection of Federal Street at Chapman Street. Parking for the commercial uses will be derived from on-street parking and public parking lots.

JULY 2022 TIAS

General

Comment: *The July 2022 TIAS and the subsequent September 2022 RTC were prepared in a professional manner and following the applicable standards of care, and was prepared under the responsible charge of Rebecca L. Brown, P.E., PTOE (MA P.E. No. 49112, Civil).*

Existing Conditions

Study Area

The study area that was assessed in the July 2022 TIAS was developed in consultation with the City and consisted of Cabot Street, Rantoul Street (Route 1A), and the following specific intersections:

- Cabot Street/West Dane Street/Dane Street
- Cabot Street/Pond Street/Winter Street/Knowlton Street
- Cabot Street (Route 22)/Federal Street/Church Street (Route 22)
- Cabot Street (Route 22)/Hale Street
- Cabot Street (Route 22)/Bow Street/Abbott Street
- Cabot Street (Route 22)/Wallis Street
- Cabot Street (Route 22)/Broadway/Thorndike Street
- Federal Street/Chapman Street
- Chapman Street/Bow Street
- Rantoul Street (Route 1A)/Bow Street
- Rantoul Street (Route 1A)/Federal Street

Comment: *This study area includes all intersections where the Project is predicted to result in an increase in peak hour traffic volumes by: a) five (5) percent or more, or b) by more than 100 vehicles per hour. Project-related impacts outside of this area, while measurable, would not be considered significant when compared to baseline (No-Build) conditions.*

Traffic Volumes and Data Collection

Traffic volume data was collected by means of: i) automatic traffic recorder counts (ATRs) performed on Chapman Street and Federal Street; and ii) turning movement counts (TMCs) and vehicle classification counts conducted at the study intersections. The ATRs were conducted on Thursday, May 19th through Saturday, May 21, 2022, with the TMCs conducted during the weekday morning (7:00 to 9:00 AM) and weekday evening (4:00 to 6:00 PM) peak periods on Thursday, March 21, 2019, Thursday, May 19, 2022, and on Tuesday, June 14, 2022, and during the Saturday midday peak period (11:00 AM to 1:00 PM) on Saturday, March 23, 2019, Saturday, May 21, 2022 and on Saturday June 11, 2022. These time periods were selected as they are representative of the peak traffic volume periods for both the Project and the adjacent roadway network. A review of seasonal adjustment data available from MassDOT indicated that traffic volumes within the study area during the month of March are approximately 9.1 percent below those under average-month conditions, with traffic volumes in the months of May and June representative of conditions that higher than those under average-month conditions.

A review of historic traffic count data collected by MassDOT along Route 128, north of Brimbal Avenue, was undertaken in order to determine if an adjustment was required in order to account for the impacts on traffic volumes and trip patterns resulting from the COVID-19 pandemic. Based on this review, the following conditions were noted:

- *May 2022:* Average daily traffic volumes are 7.0 percent lower than 2019 traffic volumes, with Saturday traffic volumes 5.0 percent higher;

- *June 2022:* Average weekday and Saturday traffic volumes are 1.0 percent and 6.0 percent lower than 2019 traffic volumes, respectively

Based on this comparative analysis, the Saturday traffic volumes that were collected in May 2022 were not adjusted, with all other traffic counts adjusted upward accordingly. The March 2019 traffic count data was collected prior to the restrictions that were implemented as a result of the COVID-19 pandemic and did not require a pandemic-related adjustment.

Comment: *The data collection effort and COVID-19 impact review and adjustment were completed following MassDOT standards and the guidance for Transportation Impact Assessments (TIAs) conducted during the COVID-19 pandemic,[1] and we are in general agreement with the resulting traffic volumes.*

Pedestrian and Bicycle Facilities

A description of pedestrian and bicycle facilities within the study area was included as a part of the July 2022 TIAS. As described therein, sidewalks of varying condition are generally provided along both sides of the study area roadways, with marked crosswalks and wheelchair ramps provided for crossing one or more legs of the study area intersections. Deficiencies were identified at the following intersections:

- *Cabot Street/Bow Street/Abbott Street* – Wheelchair ramps on southeast corner not Americans with Disabilities Act (ADA) compliant
- *Cabot Street/Wallis Street* – Planters and restaurant seating on southwest corner limit effective sidewalk width to 4-feet; non-ADA complaint wheelchair ramps (tactile warning devices missing)
- *Cabot Street/Broadway/Thorndike Street* – Wheelchair ramps are in poor condition and non-ADA compliant (tactile warning devices missing)
- *Federal Street/Chapman Street* – Sidewalk on south side of Federal Street is in poor condition
- *Chapman Street/Bow Street* – Sidewalk on north side of Bow Street is in poor condition

Bicycle accommodations are not provided along the study area roadways or at the study area intersections.

Public Transportation

Regularly scheduled public transportation services are provided within the study area by the Massachusetts Bay Transportation Authority (MBTA) and the Cape Ann Transportation Authority (CATA). The MBTA provides fixed-route bus service along Cabot Street by way of the Route 451 bus (*North Beverly Station - Salem Depot*), which provides service from the Commodore Plaza in North Beverly to Salem Station on the Newburyport/Rockport Line of the MBTA Commuter Rail system. The closest regular stop to the Project site for the Route 451 bus is located adjacent to the Project site at the Cabot Street/Federal Street/Church Street intersection. Beverly Station on the Newburyport/Rockport Line of the MBTA Commuter Rail system is located approximately 0.4 miles to the west of the Project site, or an approximate 8 minute walking distance. The CATA operates the Beverly Shuttle, which provides fixed-route bus service

[1] *Guidance on Traffic Count Data*; MassDOT; revised April 2020.

within Beverly and Danvers, and includes service to Beverly Station. The Beverly Shuttle travels along Cabot Street and past the Project site, with the closest regular stop located to the south of the Project site at Beverly City Hall, an approximate 1-minute walking distance.

Comment: The Project is well situated to take advantage of available public transportation services in order to reduce traffic volumes and parking demands.

Motor Vehicle Crash Summary

Motor vehicle crash information for the study area intersections was obtained from MassDOT for the most recent 5-year period (2015 through 2019) and a summary table was provided in the July 2022 TIAS. Based on a review of the crash data, the study intersections experienced an average of 4.6 or fewer reported motor vehicle crashes per year over the 5-year review period, with the largest number of crashes reported at the Cabot Street/West Dane Street/Dane Street (23 crashes total) and Cabot Street/Bow Street/Abbot Street (19 crashes total) intersections. The majority of the crashes involved rear-end type crashes that resulted in property damage only, with no (0) crashes resulting in a fatality. Crashes involving a pedestrian or bicyclist were reported at the following intersections:

- Cabot Street/West Dane Street/Dane Street (5 crashes)
- Cabot Street/Pond Street/Winter Street/Knowlton Street (1 crash)
- Cabot Street/Federal Street/Church Street (4 crashes)
- Cabot Street/Broadway/Thorndike Street (1 crash)
- Rantoul Street/Bow Street (4 crashes)
- Rantoul Street/Federal Street (1 crash)

The motor vehicle crash rate (i.e., number of motor vehicle crashes per million entering vehicles (MEV)) was calculated for the study intersections and compared to MassDOT crash rates for similar intersections. Based on this comparative assessment, the following study intersections were identified to have a motor vehicle crash rate that is above the MassDOT average crash rate for similar intersections:

- Cabot Street/West Dane Street/Dane Street
- Cabot Street/Pond Street/Winter Street/Knowlton Street
- Cabot Street/Hale Street
- Cabot Street/Bow Street/Abbott Street
- Federal Street/Chapman Street
- Chapman Street/Bow Street

The Rantoul Street/Bow Street intersection was identified to have a motor vehicle crash rate that is equivalent to the MassDOT average crash rate for an unsignalized intersection.

It was noted that improvements have been completed within the study area and at the study intersections that have occurred since 2019 that are expected to result in a reduction in the frequency of occurrence of motor vehicle crashes, particularly those that involved a pedestrian.

Comment: The motor vehicle crash analysis was completed following accepted standards and we are in agreement with the results.

Comment T1: ***A review of the MassDOT High Crash Location (HSIP) database should be undertaken in order to determine if there are designated located within the study area. Our review indicates that the following intersections have been designated as high crash cluster locations for the 2017-2019 reporting period:***

- ***Cabot Street/West Dane Street/Dane Street***
- ***Cabot Street/Pond Street/Winter Street/Knowlton Street***

Just outside of the study area, the Federal Street/Park Street intersection is also listed as a high crash cluster location. Specific recommendations should be provided to advance safety-related improvements at locations where the calculated crash rate exceeds the MassDOT average crash rate and/or the intersection is listed as a high crash location.

Future Conditions

No-Build Conditions

Traffic volumes within the study area were projected to 2029, which represents a 7-year planning horizon from the existing conditions base year (2022) consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. The future condition traffic volume projections were developed by: i) applying a background traffic growth rate to the 2022 Existing traffic volumes; and ii) adding traffic associated with specific development projects by others that may increase traffic volumes within the study area beyond that accounted for by the background traffic growth rate.

A 1.0 percent per year compounded annual background traffic growth rate was identified for use to reflect anticipated future traffic growth independent of specific development projects based on a review of historic traffic growth information available from MassDOT. The Applicant's engineer consulted with the Beverly Planning & Community Development in order to ascertain if there were any specific development projects by others that would result in an increase in traffic volumes within the study area that would exceed the background traffic growth rate. Based on this consultation, the following projects were identified for inclusion in the future condition traffic volume projections:

- *Mission Boathouse, Cabot Street/Essex Bridge/Water Street* (6,800± sf quality restaurant)
- *Depot Square II, 132 Rantoul Street* (106 multifamily units and 79,000± sf of retail/restaurant space)
- *Briscoe Village for Living & The Arts, 7 Sohier Road* (85 affordable senior units, 6 live/work studios and a 500± seat theater/auditorium)

In addition, research of current or planned future roadway improvement projects that may be undertaken within the study area was also undertaken. MassDOT announced the closure of the Hall-Whitaker Drawbridge on June 15, 2022 due to deterioration of the bridge structure. The bridge is expected to remain open to pedestrians and bicyclists. As a result of the closure, MassDOT is advancing the design of a replacement bridge, with construction expected to commence in the spring of 2027.

Comment: *We are in agreement with the methodology that was used to develop the future No-Build condition traffic volume projections, including the background traffic growth rate*

(1.0 percent) and inclusion of the identified specific development projects by others. We note that the closure of the Hall-Whitaker Drawbridge (June 15, 2022) was identified to have occurred after the date of the traffic counts that form the basis of the July 2022 TIAS (latest counts were performed on June 14, 2022).

Build Conditions

The traffic characteristics of the Project were developed by the Applicant's engineer using trip-generation statistics published by the Institute of Transportation Engineers (ITE)[2] for similar land uses as those that will be located within the Project site ITE Land Use Codes (LUCs) 221, *Multifamily Housing (Mid-Rise)*, 822, *Strip Retail (<40k)*, and 932, *High-Turnover (Sit-Down) Restaurant*, were used to develop the base trip characteristics for the Project. Given the mix of uses that are planned within the Project site, it is expected that a portion of the trips will consist of internal trips, or a trip that is made between uses and is common in mixed-use developments. By way of example, a resident of the Project may patronize the retail store or restaurant that will be located within the Project site. These internal trips are not accounted for when the trip calculations are developed on an individual land use basis. The ITE promulgated internal capture rate trip methodology was used and applied to the base trip-generation calculations for the Project.

Trips associated with the existing uses that occupy the Project site (17,500 sf of restaurant/retail space and 6,000 sf of office space) were developed using the ITE trip-generation data for the appropriate land uses. For the existing restaurant use (Bonefish Harry's) it was assumed that no (0) trips were generated during the weekday morning peak-hour. Internal trips were also applied (subtracted) to the base ITE trip-generation calculations for the existing uses following a similar methodology to the proposed uses.

In order to account for the use of alternative modes of transportation to single-occupancy vehicles (SOVs), the ITE trip data for a multifamily residential use in a dense multi-use urban environment located within a ½ mile of a rail transit station were used. For the retail and restaurant components, it was assumed that 5 percent of the trips would be made by transit based on data available from the ITE for retail/restaurant uses located in mixed-use environments with transit access, and an additional 7 percent would consist of pedestrian/bicycle trips based on data from the U.S. Census for the City of Beverly.

After accounting for internal trips, existing trips and the use of alternative modes of transportation to SOVs, the remaining automobile trips were further disseminated into primary trips and pass-by trips. Pass-by trips are not new trips to the area as a result of the Project and are associated with retail and restaurant trips. A pass-by trip consists of a motorist that is traveling along a roadway adjacent to the Project site for other purposes that will also patronize the retail or restaurant use located within the Project before continuing to their original destination. A 30 percent pass-by trip rate was applied to the automobile trips associated with the retail and restaurant components of the Project and was developed based on a review of pass-by trip data available from the ITE, which was shown to range from an average of 31 percent to 43 percent.

For simplicity, the table below summarizes and compares the unadjusted trip characteristics of the Project and those of the existing uses that occupy the Project site and that will be removed to accommodate the Project.

[2] *Trip Generation*, 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

TRIP GENERATION SUMMARY AND COMPARISON

Time Period	(A) Proposed Mixed-Use Redevelopment[a]	(B) Existing Uses[b]	(A – B) Difference
Average Weekday Daily:			
Entering	452	586	
Exiting	452	586	
Total	904	1,182	-278
Weekday AM Peak-Hour:			
Entering	34	33	
Exiting	47	15	
Total	81	48	+33
Weekday PM Peak-Hour:			
Entering	63	68	
Exiting	40	73	
Total	103	141	-38
Saturday:			
Entering	520	759	
Exiting	520	759	
Total	1,040	1,518	-478
Saturday Midday Peak-Hour:			
Entering	52	65	
Exiting	50	62	
Total	102	127	-25

[a]Based on 113 multifamily residential units, 2,741 sf of retail space and 4,913 sf of restaurant space.
[b]Based on 6,053 sf of office space, 14,035 sf of retail space and 2,850 sf of restaurant space.

Traffic volumes associated with the Project were assigned to the roadway network based on a review of Journey-to-Work data obtained from the U.S. Census for residents of the City for the residential component of the Project and existing traffic patterns for the retail/restaurant components. Using this methodology, the traffic volumes associated with the Project were assigned as follows:

TRIP DISTRIBUTION

Direction	Percentage to/from Residential Trips		Retail / Restaurant Trips	
	Enter	Exit	Enter	Exit
Dane Street East	5	--	5	--
Church Street East	--	15	--	15
Hale Street East	--	5	--	5
Abbott Street East	5	--	2	--
Thorndike Street East	--	--	10	2
Federal Street West	25	--	2	--
Chapman Street North	--	--	1	1
Cabot Street North	15	20	15	15
Rantoul Street North	25	35	20	20
Cabot Street South	10	15	20	17
Rantoul Street South	15	10	25	25
Total	100	100	100	100

Comment: *We are in general agreement with the methodology and approach that was used to develop the traffic characteristics of the Project and to establish the trip distribution pattern. The net reduction in commercial space at the Project site is expected to result in comparable or reduced automobile trips. The addition of residential use to the Project site provides an opportunity to further reduce automobile trips and parking demands in the area with proper design and inducements.*

Traffic Operations Analysis

In order to assess the potential impact of the Project on the transportation infrastructure, a detailed traffic operations analysis was performed for the study intersections under 2022 Existing, 2029 No-Build (without the Project) and 2029 Build conditions (with the Project). In brief, traffic operations are described by six "levels of service" which are defined by letter grades from "A" through "F", with a level-of-service (LOS) "A" representing the best operating conditions (average motorist delays of less than 10 seconds and little or no apparent vehicle queuing) and a LOS "F" representing constrained operating conditions (average motorist delays of 50 to 80 seconds or more and often with apparent vehicle queuing). A LOS of "E" is representative of an intersection or traffic movement that is operating at its design capacity, with a LOS of "D" typically representing the limit of acceptable traffic operations.

As expected given that the Project is predicted to result in a relatively minor increase in traffic during the weekday morning peak-hour and a reduction in traffic during both the weekday evening and Saturday midday peak hours, the addition of Project-related traffic to the study area intersections was not shown to result in a change in level of service or a significant increase in motorist delays or vehicle queuing over No-Build conditions. That being said and independent of the Project, the following intersections were identified to have one or more movements that were operating at or over capacity (i.e., LOS "E" of "F"):

- Cabot Street/West Dane Street/Dane Street (Dane Street westbound left-turn movement)
- Cabot Street/Pond Street/Winter Street/Knowlton Street (Pond Street approach)
- Cabot Street/Federal Street/Church Street (Federal Street approach)
- Cabot Street/Hale Street (Hale Street approach)

- Cabot Street/Broadway/Thorndike Street (Broadway approach)
- Rantoul Street/Federal Street (Federal Street approach)

The Project was not shown to result in a material increase in motorist delay or vehicle queuing on these movements and, in most instances, the slight reduction in traffic caused a corresponding reduction in delay and vehicle queueing of a similar magnitude.

All movements exiting the Project site driveway to Route 38 are predicted to operate at LOS C/D with vehicle queues of up to one (1) vehicle. All movements along Route 38 approaching the driveway are predicted to operate at LOS A/B with negligible vehicle queuing.

Comment: *We are in agreement with the methodology that was used to complete the traffic operations analysis and the overall conclusion that the Project will not result in a significant impact (increase) on motorist delays or vehicle queueing over No-Build conditions.*

An assessment of traffic operations at the Project site driveway intersections with Chapman Street was not provided. That being said and given the relatively low conflicting traffic volumes on Chapman Street (bi-directional traffic volumes of between 30 and 65 vehicles during the peak hours), it can be inferred that motorists exiting the Project site will experience limited delay.

Sight Distance

An evaluation of sight lines at the Project site driveway intersections with Chapman Street was completed following American Association of State Highway and Transportation Officials (AASHTO)[3] standards and using a 20 mph approach speed, which is consistent with the measured 85th percentile vehicle travel speed that was recorded along Chapman Street. Based on this evaluation, it was concluded that the available sight lines along Chapman Street approaching the driveways were unimpeded. Sight lines for motorists exiting the Project site were found to be limited by the proposed building structure, requiring exiting maneuvers to be made in three stages: 1) the exiting driver looks for pedestrians within the sidewalk area; 2) when clear, the driver positions the vehicle within the sidewalk area until they can observe motor vehicles and bicyclists traveling along Chapman Street; and 3) when clear, the driver completes the exit maneuver. As stated in the September 2022 RTC, the Applicant will install a pedestrian alert system to alert pedestrians walking along Chapman Street when a vehicle is exiting the residential parking garage.

Comment T2: ***A sight triangle plan should be prepared for the Project site driveway intersections that illustrates the sight distance for: i) a driver exiting the garage to a pedestrian in the sidewalk; and then ii) for a driver exiting the driveway assuming that the vehicle occupies the sidewalk area. The sight triangle plan should consider the building wall location for the sight lines to a pedestrian and the presence of on-street parking along Chapman Street for the final exit maneuver.***

[3]Ibid 1.

Recommendations

The following recommendations were provided as a part of the July 2022 TIAS and expanded as a part of the September 2022 RTC:

Transportation Demand Management:

- *Sidewalk Infrastructure.* The Applicant will reconstruct the sidewalk along the easterly side of Chapman Street (between Bow Street and Federal Street) and along the southerly side of Federal Street (along site frontage).
- *Public Transportation.* The Applicant will encourage use of public transportation and post information on public transportation services in common areas of the building, as well as provide information to residents upon move-in.
- *Parking.* The Applicant will provide 15 electric vehicle charging stations within the parking garage. Additional conduit will be provided for future electric vehicle charging needs.
- *Partnership with Local TMA.* The Applicant is committed to partnering with the local Transportation Management Agency (TMA), the North Shore Regional Planning Agency, to explore the opportunity to expand shuttle service to the site and evaluate potential TDM measures, as well as offer employee incentives.
- *Resident Information.* The Applicant will provide all new residents with information regarding local Commuter Rail, bus, car-sharing, and other public transportation services in the area upon move-in. Transit route maps and schedules will be posted in a common area in the building.
- *Employee Information.* The Applicant will encourage the retail and restaurant tenants to provide direct deposit of paychecks and enroll new employees with NuRide as part of the orientation process. NuRide is a program to help individuals make greener trips by walking, biking, carpooling, and using public transportation. It is a free service offered through MassRIDES that is supported by sponsors who provide incentives and discounts to NuRide members for making greener trips. MassRIDES also uses NuRide to assist individuals in traveling together in carpools and vanpools, cutting greenhouse gas emissions, reducing traffic congestion, and tracking green trips to earn rewards. Use of NuRide will allow employees to find ride-sharing matches in the area and identify public transportation services and other means of travel available.
- *Bicycle Storage.* Two secure bicycle storage rooms will be provided on-site for residents with interior and exterior doors and a repair station to encourage bicycle trips to/from the site. Enough space will be provided for 153 bikes.

Pedestrian Mobility Improvements

- *Cabot Street/Wallis Street.* The curb ramps and crosswalks at the intersection of Cabot Street/Wallis Street should be reconstructed to provide a fully ADA-accessible route to the Yellow Line bus stop to/from the site. In addition, new MUTCD-compliant pedestrian crossing warning signage should be installed on Cabot Street to alert drivers to pedestrians crossing the roadway at this location.

- *Bow Street.* The sidewalk along the northerly side of Bow Street between Chapman Street and Cabot Street should be reconstructed to provide ADA-accessibility for pedestrians walking between the site and nearby businesses, parking areas, and bus stops.

Chapman Street/Bow Street

- Modify corner radii, reduce sidewalk width to 6-feet at the intersection corner, relocate signs and restrict parking in order to facilitate fire truck turning maneuvers at the intersection.

Cabot Street/Dane Street/West Dane Street

- Consider adding a left-turn lane on the Cabot Street southbound approach and restripe the Dane Street approach to provide separate left and right-turn lanes.

Comment T3: ***The Applicant should commit to implementing the pedestrian mobility improvements at the Cabot Street/Wallis Street intersection, the sidewalk improvements that were identified along Bow Street and the fire truck maneuverability improvements at the Chapman Street/Bow Street intersection.***

In addition, consideration should be given to advancing pedestrian safety improvements at the following intersections to include the installation of pedestrian crossing warning signs, reconstruction of wheelchair ramps where necessary to meet ADA requirements and reapplication of crosswalk pavement markings where faded:

- ***Cabot Street/Bow Street/Abbott Street***
- ***Federal Street/Chapman Street***
- ***Chapman Street/Bow Street***

SITE PLANS

The following comments are offered with regard to our review of the June 10, 2022 Site Plans prepared by Hancock Associates, et al:

Comment S1: ***The garage doors should be recessed within the building so that a queued vehicle entering the garage does not extend into the traveled-way along Chapman Street. The design of the garage entrance and door location should be informed by the sight distance analysis requested in Comment T2.***

Comment S2: ***The garage doors appear to be 18 feet in width and would do not allow for two-way traffic. The garage doors and the driveway openings leading to the doors should be increased to 20-feet in width.***

Comment S3: ***The Applicant should verify if on-street parking along Chapman Street will be removed or modified to accommodate access to the Project site. These modifications should be reflected on the Site Plans along with the requisite regulatory signs.***

Comment S4: ***The sight triangle areas for the Project site driveways should be shown on the Site Plans along with a note to indicate: "Signs, landscaping and other features located within sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5-feet in height. Snow accumulation (windrows) located within sight triangle areas that exceed 3.5-feet in height or that would otherwise inhibit sight lines shall be promptly removed."***

Comment S5: ***A note should be added stating: "All Signs and pavement markings to be installed within the Project site shall conform to the applicable specifications of the Manual on Uniform Traffic Control Devices (MUTCD)."***

Comment S6: ***A narrative should be provided that describes how tenant moves and loading and delivery activities for the commercial tenants will be managed. The narrative should include the locations where vehicles associated with these activities will be accommodated.***

Comment S7: ***A vehicle turning analysis should be provided using the AutoTurn© software for a service/delivery/moving vehicle (SU-30 or SU-40 design vehicle). The turning analysis should depict all maneuvers required to access the required areas defined as a part of the narrative requested in Comment S4, including the pick-up of trash/recycling.***

Comment S8: ***The parking spaces at the end of each row of parking are only accessible by backing into the spaces. A vehicle turning analysis should be performed for each end parking space to demonstrate that sufficient maneuvering area is available. This analysis should be performed using the AutoTurn© software for a passenger car design vehicle (P design vehicle, 19-feet in length).***

PARKING

On-site parking will be provided for 153 vehicles to support the residential use, including three (3) handicapped accessible parking spaces and 20 tandem parking spaces, four (4) of which are compact parking spaces. Additional parking for residents will be provided in an existing surface parking lot that is located on the southwest corner of the intersection of Federal Street at Chapman Street that provides surface parking for 29 vehicles. Parking for the commercial uses will be derived from on-street parking and public parking lots.

Section 300-59, *Off-Street Parking Requirements*, of the Zoning Code requires that 1.0 parking spaces be provided for residential units with one bedroom and that 2.0 parking spaces be provided for residential units with two or more bedrooms. The residential component of the Project will provided 73 one bedroom units and 40 two bedroom units, requiring that 153 parking spaces be provided to support the residential use, which is consistent with the parking supply that will be available at the Project site.

For the retail use, the Zoning Code requires that 1.0 parking spaces per 275 sf of gross floor area be provided, or 7 parking spaces to support the 1,974 sf of retail space that is proposed. For the restaurant use, the Zoning Code requires that 1.0 parking spaces for every 4 seats be provided, or 38 parking spaces to support the proposed 150 seats that will be available within the restaurant. In total, the retail and restaurant uses that are associated with the Project require 45 parking spaces, which the Zoning Ordinance states can be satisfied as follows:

1. On-site;
2. Off site on a privately owned lot located within 500 feet of the property/use(s) it is designed to serve;
3. Off site in a public parking facility located within 500 feet of the property/use(s) it is designed to serve; or
4. On street, if and to the extent such parking spaces are completely contained within the frontage of the property.

The Applicant has stated that parking for the retail and restaurant uses will be satisfied through off-site public parking located within 500 feet of the Project site and on-street parking along the Project site frontage on Cabot Street and Federal Street.

An updated parking study that assessed the availability of off-site, public parking to meet the parking requirements for the retail and restaurant components of the Project was included as a part of the September 2022 RTC. This study indicated that in July 2022 there were 580 on-street or off-street parking spaces located within a 500-foot radius of the Project site. Parking demand observations conducted from 5:00 to 8:00 PM on a weekday, the peak parking demand period for a retail/restaurant use, indicated that 48 of the 98 public parking spaces located within the Project site were occupied and 244 off-site parking spaces were occupied, or a total parking demand of 292 parking spaces. After accounting for the elimination of the 98 public parking spaces within the Project site that will be removed from the public parking supply, the total number of available public parking spaces within 500 feet of the Project site will be reduced from 580 parking spaces to 482 parking spaces. With an observed parking demand of 292 parking spaces and an available parking supply of 482 parking spaces after the Project is complete, the available parking supply during the peak parking demand period would be 190 parking spaces, which is more than sufficient to accommodate the 45 parking spaces that are required to support the proposed retail and restaurant uses without consideration of the parking demands that are associated with the existing uses that occupy the Project site and that will be removed.

A review of parking demands when an event is scheduled at the Cabot Theater was also performed. This review indicated that 99 public parking spaces are available within 500 feet of the Project site to support additional public parking, including those associated with the proposed retail and restaurant uses.

Comment P1: The number of tandem parking spaces that are provided within the residential parking garage should be clarified. Ground Floor Plan A1.01 appears to indicate that 32 tandem parking spaces are provided.

Comment P2: The parking space assignment within the residential parking garage should be defined. The tandem parking spaces will need to be assigned to the two bedroom units.

Comment P3: A narrative describing the access controls or restrictions that will be used for the Chapman Street/Federal Street surface parking lot should be provided.