

Lisa Schwarz, Assistant Director
Town of Andover
36 Bartlett Street
Andover, MA 01810

April 18, 2024

Ref. T1265.09

Re: Town Yard Redevelopment – Andover, Massachusetts
Traffic Engineering Peer Review #2

Dear Ms. Schwarz:

On behalf of the Town of Andover, TEC, Inc. (TEC) has reviewed revised documents as part of the traffic engineering peer review for the proposed redevelopment of the former Town Yard property within the Historic Mill Overlay District in Andover, Massachusetts (“the Project”). The following materials were considered as part of our review:

- *Site Development Plans – 2-4 Buxton Court, 7-9 & 11 Lewis Street, 35 Pearson Street & 122 North Main Street - Andover, MA*, prepared by The Morin-Cameron Group, Inc., dated March 14, 2024.
- *VAI Response to Traffic Engineering Peer Review, Town Yard Redevelopment - Andover, MA*, prepared by Vanasse & Associates, Inc., dated March 18, 2024.

For consistency, the original comment numbers have been retained from the most recent TEC Peer Review letter dated January 25, 2024. TEC’s original comments are shown in **bold**, the Applicant’s responses to the comments are shown as *italics*, and TEC’s follow-up responses are shown as standard text.

Traffic Impact Assessment

Comment 1: **The *Traffic Impact Assessment* (TIA) included the following intersections within the study area:**

- **North Main Street (Route 28) / Railroad Street / Private Driveway / Retail Plaza**
- **North Main Street (Route 28) / Lewis Street**
- **North Main Street (Route 28) / Pearson Street**
- **Pearson Street / Lewis Street [Site Driveway] / Depot Pizza Parking Driveway**
- **Pearson Street / Essex Street / Railroad Street / Dundee Park Drive**
- **Essex Street / School Street**
- **Essex Street / Ridge Street / Brook Street**
- **School Street / Lupine Road / Ridge Street**

The North Main Street (Route 28) / Main Street (Route 28) / Elm Street / Central Street intersection, also referred to as Elm Square, was evaluated as part the separate *Supplemental Traffic Analysis (STA)* document discussed at the end of this TIA review section.

TEC believes that the intersection of Lewis Street / Buxton Court should be added to the study area in terms of safety review and, at a minimum, a qualitative analysis of the traffic operations. Note that a qualitative analysis of the operations will not require formal turning movement counts (TMCs) to be conducted; however, the TIA should provide information as to the traffic volume impacts to each approach.

Applicant Response: Lewis Street at Buxton Court is currently a T-intersection operating with Buxton Court as the minor street under stop-like control, with no pavement markings delineating travel direction present. In terms of safety, no crashes have occurred at this intersection between 2016 and 2022. Under the future Build condition with the Project, this T-intersection will be modified to a 90-degree junction without conflicting traffic volumes, so there will be no need for traffic control signage. Build condition traffic volumes at the intersection are projected to increase by 16-20 vehicles compared to No-Build traffic volumes. This is equivalent to one vehicle every 3 minutes. Under Existing conditions Lewis Street connects to Pearson Street at the west end of the roadway. Under Build conditions Lewis Street west of Buxton Court will be a dead-end and Buxton Court will wrap around the residential building and become the site driveway at the west end of the roadway.

TEC Response: Comment addressed. No further response required.

Comment 2: The TIA states that a comprehensive field inventory of the study area was conducted in August and September 2023. The inventory consisted of existing roadway geometrics, traffic volumes, operating characteristics, posted speed limits, parking characteristics, access driveways, and the current configuration. Many components of the roadway characteristics are not described as part of the study.

Although the TIA notes that exclusive turn lanes have been provided at some intersections following repaving, please provide more detail as to the location of these turn lanes as the width of Pearson Street (roughly 24 feet curb-to-curb) does not seem to support any additional lanes beyond the two opposing general-purpose lanes. Was the intent to describe the new turn lane along north main Street at its intersection with Pearson Street?

Applicant Response: The statement in the comprehensive field inventory section was general and not indicative of every roadway in the study area.

TEC Response: See Comment #3 and TEC's response to Comment #3.

Comment 3: In conjunction with Comment #2 above, please provide detailed description of each study area intersection beyond the data / information provided in Figure 2 such as on-street parking, approach-by-approach control, control signage and pavement markings,

directional separation, etc. Please include any other descriptive measures that may be pertinent to the analysis and recommendations further described alter in the TIA.

Applicant Response: [Various Intersection Descriptions – See VAI Letter]

TEC Response: Comment generally addressed. TEC notes that there are a few minor text discrepancies; including at the intersection of Essex Street / Ridge Street / Brook Street there is notation of The Ridge Street and the Essex Street west approaches are bi-directional, and each street has a double yellow centerline with no pavement markings. If there is a double yellow centerline there actually are pavement markings.

Comment 4: **TMCs were conducted at the study area intersections in September 2023 between the hours of 7:00 AM and 9:00 AM for the weekday morning peak period and between the hours of 4:00 PM and 6:00 PM for the weekday evening peak period. Peak hours analyzed within these periods have not been specifically mentioned in the body of the TIA. In reviewing the TMCs in the Appendix, the AM and PM peak hours appear to begin at 8:00 AM and 4:45 PM, respectively, at most locations. This should be clarified so to note locations that may be different, leading to unbalanced traffic volumes intersection-to-intersection.**

Applicant Response: The morning and evening peak hours for the study area intersections:

- North Main Street (Route 28) at Railroad Street (8:00, 4:45)
- Route 28 at Lewis Street (8:00, 4:45)
- Route 28 at Pearson Street (8:00, 4:45)
- Pearson Street at the site driveway/Depot Pizza parking lot (8:00, 5:00)
- Pearson Street at Essex Street and Railroad Street/Dundee Park Drive (7:45, 4:30)
- Essex Street at School Street (7:45, 5:00)
- Essex Street at Ridge Street and Brook Street (7:45, 5:00)
- School Street at Lupine Road and Ridge Street (7:45, 5:00)

It is mentioned in the figures that some intersections are not balanced to one another; however, the peak hour volumes for each individual intersection were used for analysis purposes.

TEC Response: Comment addressed. No further response required.

Comment 5: **Traffic volumes were reviewed for weekday seasonal adjustments based on historical traffic-volume data from Massachusetts Department of Transportation (MassDOT). Traffic counts for September reflect above average conditions, so they were not seasonally adjusted. TEC concurs with this methodology.**

Applicant Response: No response required.

TEC Response: Comment addressed. No further response required.

Comment 6: **Bicycle and pedestrian counts were evaluated during the same periods noted in Comment #4. A comprehensive field inventory of existing sidewalks, pedestrian crossing locations, and bicycle facilities was conducted as well, and is described on page 7 of the TIA. Figure 2 also shows pedestrian facilities graphically. In a field review, TEC determined that there is one additional pedestrian crossing on Railroad Street at the MBTA Commuter Rail Station. This should be stated in the TIA.**

Applicant Response: The indicated pedestrian crossing has been added to the Figure 2 which is included in the updated TIA.

TEC Response: Comment addressed. No further response required.

Comment 7: **Public transportation consists of the MBTA Haverhill Line via Andover Station to/from North Station in Boston as well as MVRTA bus service on Routes 21 and 2. Description of the proximity for each public transportation use is provided in Table 2 and scheduling information has been provided in the Appendix. No response required.**

Applicant Response: No response required.

TEC Response: Comment addressed. No further response required.

Comment 8: **MassDOT crash records were evaluated for the years 2016-2020, the latest available 5-year period of complete data and have been described in the TIA. Of the eight (8) study area intersections studied, three (3) were shown to have crash rates above 0.57 crashes per million entering vehicles (MEV) for unsignalized intersections (MassDOT District 4 rate). These intersections include Pearson Street / Lewis Street [Site Driveway] / Depot Pizza Parking Driveway (0.86 crashes per MEV), Essex Street / School Street (0.64 crashes per MEV), and Essex Street / Brook Street / Ridge Street (1.25 crashes per MEV). The TIA does not describe direct off-site mitigation by the Applicant to reduce these crash rates or directly address safety at these locations. Although off-site mitigation is further described in subsequent comments, the Applicant should work with the Town to evaluate and implement, at a minimum, short-term / low-cost safety improvement countermeasures at these key locations.**

Applicant Response: The intersections noted to have crash rates above the MassDOT average crash rates are projected to be improved by the MassWorks grant project.

TEC Response: It is possible the Town Yard redevelopment could occur with or without the Mass Works project. TEC understands that the Mass Works project is funded and still in the design stage; however, until design is complete, and the construction is commenced, there is no guarantee that the project will be completed. With the understanding that any commitments to mitigation may be moot upon this, the Applicant should work with the Town to

evaluate and implement, at a minimum, short-term / low-cost safety improvement countermeasures at these key locations.

Comment 9: To obtain future year volumes (2030), the September counts were adjusted at a rate of 1% per year compounded, based on area growth between 2009 and 2019. This growth rate accounts for background traffic as well as for a specific development by others (#305 North Main Redevelopment). TEC finds this acceptable. Another project described is located at the Draper Block – #27 Main Street. The TIA states that based on a special permit for this project site-generated trips were included in the Town Yard Redevelopment; however, the trip generation for Draper Block, which would be applied to the 2030 No-Build volumes, has not been provided in the TIA, and therefore, cannot be confirmed.

Applicant Response: The 27 Main Street Project (Draper Block project) site-generated trips are shown in the Appendix to this letter as Figure A1 and Figure A2.

TEC Response: The Applicant has provided a marked-up version of the trip generation. Is there a clean version directly from the project's TIA?

Comment 10: The TIA describes roadway improvement work conceptually planned under a Mass Works Infrastructure Grant along the Essex Street Corridor. The \$3.3 million grant was obtained by the town in October 2023 to directly support the Town Yard site. These improvements include, but are not limited to:

- Removal of the Pearson Street connection to the existing Pearson Street / Essex Street / Railroad Street / Dundee Park Drive intersection.
- Essex Street and Brook Street will be reconstructed to provide one-way and two-way bike lanes. At certain locations, there will be on-street parking provided along one or both sides of the roadway.
- A marked crosswalk will be provided for crossing the approach of School Street for the intersection of Essex Street / School Street.
- At the Depot Pizza location along Pearson Street is where Pearson Street will be turned into a small roundabout and cut back from the five-way intersection with Essex Street.

The timing of this Mass Works project construction would generally coincide with the redevelopment of the Town Yard based on redevelopment-specific supporting nature of the public infrastructure improvements defined in the grant application. It is possible the Town Yard redevelopment could occur with or without the Mass Works project. Additional comments regarding operational analyses and off-site mitigation for these possibilities are subsequently identified in this peer review letter.

Applicant Response: No response required.

TEC Response: Comment addressed. No further response required.

Comment 11: The project's trip generation calculations were generated based on the industry standard Institute of Transportation Engineers (ITE) publication, *Trip Generation, 11th Edition* for Land Use Code (LUC) 221 *Multifamily Housing (Mid-Rise)*, LUC 492 *Health/Fitness Club*, LUC 712 *Small Office Building*, LUC 495 *Recreation Community Center*, and LUC 937 *Coffee/Donut Shop with Drive-Through Window*. TEC notes the following concurrence and notations:

- As the gym, office, and coffee shop uses on the site would almost exclusively be utilized by the residents of the development, separate trip generation calculations for these uses would generally be seen as conservative in nature. TEC would concur that the overall reporting of total trip generation to/from the site is likely higher than the real-life scenario expected following occupancy.
- Since the site will have multiple land uses, not all trips will originate from external traffic. An internal trip capture of 10 percent was assumed for all site land uses except the recreational community center. The Applicant should provide a more detailed breakdown of the results and the specific justification of the 10 percent internal capture rate. Note that from a macroscopic review level, TEC does agree that a 10 percent internal capture for these uses; considering the trip generation calculations were not necessarily required (see above bullet), is generally conservative in nature.
- In Table 4 of the TIA, the mode split by land use has been provided. The Appendix includes a table showing the derivation of these mode splits based on area census percentages; however, no details of the derivation of the results have been provided for review. TEC is unable to determine their validity.

The Applicant should provide a more detailed step-by-step breakdown of both internal capture, person trips, and mode share credits, as well as documentation to the justification of each credit value. This includes looking into the trip generation calculation results shown in Table 5, which effectively shows that the coffee shop, almost exclusively used by the residents, as the primary use in the AM and an extensive use throughout the day. For instance, the 'walk' and 'other' mode share for coffee shop are 30% while they are only 13% and 21%, respectively for residential land use. If the credits applied forces the resulting 'residential' trip levels down in favor of coffee shop, the higher mode split credits for coffee shop as compared to residential result in less overall trips projected; even when the residential units are the primary use.

Applicant Response: The Project is intended as a mixed-use development with convenient access to multiple public transit services. Unfortunately, there is no one ITE land use code that represents a mixed-use development with the uses

proposed that is adjacent to multiple transit services. While ITE has a Mixed-Use Development methodology for developing the exact rate of internal capture between several land uses at a site, this detailed methodology is intended for sites ranging between 100,000 square feet (sf) and 2,000,000 sf which would have peak-hour trip generation in the hundreds or potentially thousands of trips. By comparison, this site has 163 residential units with 5,000 sf of mixed commercial space. Not including the residential units, the commercial space is expected to generate 48 to 79 peak-hour trips with 63 to 89 percent of that from the café space. While the overall methodology may not be strictly applicable to this project due to its smaller size and trip generation, some data that could be used is for internal capture rates. Rates of internal capture between residential and restaurant uses in the ITE methodology range between 12 and 20 percent during peak hours; accordingly, VAI used a base internal capture rate of 10 percent.

In addition to the 10 percent internal capture rate, other adjustments were considered for the project trip generation. The initial base step was to calculate vehicle trips using ITE discrete (stand-alone) land uses. This is a conservative assumption as the commercial land uses are generally considered as accessory to the residential uses, both on-site and in the neighborhood. It was estimated that there are nearly 400 housing units within ¼ mile (a 5-minute walk) of the Project, in addition to the proposed 163 units for the Project. For many of these residents, walking or biking through the site to the cafe or the gym on their way to another destination or back home for remote work is a probability. In this case, assumptions for 30 percent walking/biking and 30 percent working from home with only 40 percent driving for these commercial uses is expected to be a conservative assumption.

Trips associated with the café have the added component of pass-by traffic to consider. Studies have indicated the amount of trips to a coffee-shop originating from existing traffic passing by the use can be as high as 90 percent. No formal pass-by traffic was assumed for this analysis, but the café should have a similar experience with customers able to walk to the café from the neighborhood or the residences onsite or picking up an order before departing the site in their personal vehicle or utilizing public transit.

With regard to the mode split for the residences, the existing census data for the census tract the site is located in likely does not reflect the same proximity of the residences to the commuter rail station as is the case with this Project. Accordingly, this data was revised and adjusted to account for an increased public transit usage, and reduced auto usage. Additional justification for this change is shown in data from ITE related to Transit-Friendly Site Mode Share data, which indicated percentage of transit for motorized trips could be between 62 and 78 percent for work/school-based trips and between 56 and 68 percent for all trips for sites within 600 feet of a heavy (commuter) rail facility. This is shown in the Appendix to this letter, Figure D.4 from the ITE Trip Generation Handbook.

TEC Response: The information provided in the updated TIA is still similar to the original study. The Applicant should provide a more detailed step-by-step

breakdown of calculation of both internal capture, person trips, and mode share credits, as well as documentation to the justification of each credit value. Please separate out each step of the calculation and provide source references for credits. Please also note the following:

- Although not included in the analysis, pass-by trips to/from the coffee shop would be expected to be limited with the closure of Pearson Street as part of the Mass Works project.
- TEC understands the use of the Figure D.4 from the ITE Trip Generation Handbook; however, this data is taken from the WMATA which pertains to the Washington DC rail system which, in comparison, is more like the MBTA's Red Line and Orange Line, not commuter rail including small headways and destination stops in close proximity. TEC agrees that the percentage of potential use is high; however, would generally only pertain to key destinations along that rail line; particularly Boston, Malden Center, Wakefield, etc.

Comment 12: **The trip distribution provided in the TIA appears to match the Journey to Work US Census data provided in the Appendix. TEC would note that the overall percentage to/from the west on Essex Street appears high and may be skewed by the Boston-metro portion of the distribution. TEC suggests that the Applicant reevaluate the trip distribution in conjunction with the public transportation credit taken as much of the site trips utilizing the MBTA Commuter Rail next door will be travelling to/from Boston (2nd highest worker destination) and Cambridge (5th highest worker destination) representing 17% of the overall workforce breakdown. Some communities will not utilize public transportation at all based on the ability to provide continuous service to/from the origin / destination of the trip.**

Applicant Response: *The census data was reevaluated based on the comment above. In addition to Boston and Cambridge, a number of Andover residents work in other locations accessible by the Haverhill commuter rail line which raises the potential for use of the commuter rail to 20 percent. The updated trip distribution is included in the updated TIA.*

TEC Response: TEC has no further comment on the above referenced comment; however, TEC does note that the distribution at the site driveway may be different based on the Town's Mass Works Grant project where the connection of Pearson Street over the tracks is expected to be eliminated.

Comment 13: **The Applicant has provided stopping sight distance (SSD) and intersection sight distance (ISD) measurements for the Site Driveway along Pearson Street. The results are shown in Table 8 of the TIA and have been compared to recommended values obtained from *A Policy on Geometric Design of Highways and Streets*, 7th Edition, American Association of State Highway and Transportation Officials (AASHTO), 2018. The measured distances have been shown in the TIA to exceed these values, except for the ISD for vehicles looking west while exiting the site (111 feet). However, Table 8 contains notes stating that three of the four measured distances have been determined if**

parked cars to the east were removed and if a hedge to the west were cut. The fourth measured distance of 241 feet (SSD approaching from the west) is questionable since Pearson Street is roughly 100 feet from its intersection with Essex Street to the site driveway. A distance of 241 feet could only be attained by measuring further west along Essex Street, which places the limit about 150 feet from the railroad tracks. At this point, the sight distance is further affected by a concrete retaining wall in the parking area of Ann's Cleaners at #2 Railroad Street, as well as a railroad signal gate and utility poles on Pearson Street near the proposed site driveway. The Applicant should provide a graphical depiction, preferably in the form of a sight triangle sheet in the site plans, of the sight lines for this driveway. Sight lines to the east along Pearson Street should not cross over the head-in parking stalls proposed along the northerly side of the roadway.

Applicant Response: The sight distance graphic for this intersection (SD-1) is included in the Appendix to this letter and in the updated TIA.

TEC Response: TEC acknowledges the sight line graphic SD-1 provided; however, the Applicant has not addressed sight line related items towards the west or the tracks in the above comment. TEC acknowledges that these sight lines may be moot based on the Mass Works project; however, there is no guarantee that the project will be completed even if funded.

Comment 14: **The Applicant should provide sight distance measurements for the intersection of Lewis Street / Buxton Court as a primary access/egress point to/from the site. The Applicant should provide a graphical depiction, preferably in the form of a sight triangle sheet in the site plans, of the sight lines at this location.**

Applicant Response: As there is no conflicting traffic volume at this location, the need for sight distance is reduced from a standard intersection. However, a graphical depiction (SD-2) is included in the Appendix to this letter and in the updated TIA.

TEC Response: Comment addressed. No further response required.

Comment 15: **TEC reviewed the results of the traffic operational analysis provided as part of the TIA. Signalized and unsignalized intersections were analyzed using Synchro 10™ software, except for the intersection of Essex Street / Pearson Street / Railroad Street / Dundee Park Drive, which was analyzed using SIDRA software since the intersection contains five approach roadways. The methodology utilized was discussed in the TIA and is compatible with MassDOT guidelines and is appropriate. For signalized intersections, the *Highway Capacity Manual (HCM) 2010* percentile delay method was used. For unsignalized intersections, the HCM 2000 delay method was used. For the SIDRA model, the delays were calculated using the SIDRA Intersection 9.0™ user Guide, which produces results based on the HCM. TEC concurs with the use of these analysis tools; however, the TIA should be clarified as Table 9 depicts the threshold from the incorrect corresponding HCM used for signalized intersections.**

Applicant Response: VAI has provided the LOS delay ranges from the correct HCM methodology in the Appendix to this letter.

TEC Response: Note that this material was not provided in the Appendix; but was provided in the revised TIA.

Comment 16: Narratives on the traffic operational analysis results for all study locations have been provided in the TIA as well as summary tables for 2023 Existing, 2030 No-Build, and 2030 Build conditions. Overall, the signalized results show levels of service (LOS) C or better for the subject signalized intersections; however, there are individual movements (Railroad Street eastbound) at the intersection of North Main Street / Railroad Street / Private Driveway / Retail Plaza that are shown to operate at LOS E for 2030 No-Build and Build conditions. The Applicant should coordinate with the Town on opportunities at 75% occupancy to reevaluate the operations at this location in the field to adjust traffic signal timings as necessary.

Applicant Response: The locations noted are expected to be improved through the MassWorks project which is expected to begin construction in fall 2024 or spring 2025 and should be complete prior to 2030; therefore, there is no need for additional evaluation.

TEC Response: Note that the location in question is the intersection of North Main Street / Railroad Street / Private Driveway / Retail Plaza which is not part of the Mass Works project. Comment not addressed.

Comment 17: Most of the individual movements at unsignalized intersections are at LOS D or better; however, some of the approaches at the Essex Street / Pearson Street / Railroad Street / Dundee Park Drive intersection are shown to operate at LOS D, E, or F, depending on the condition analyzed. A LOS of “D” or better is generally defined as “acceptable” operating conditions. Additional off-site mitigation should be explored and considered to improve the LOS E and F conditions noted. At a minimum, the Applicant should evaluate opportunities to modify the traffic control at this location. These enhancements may be an expansion of Mass Works improvements proposed at the location.

A Traffic Signal Warrant Analysis (TSWA) was conducted for the Essex Street / Pearson Street / Railroad Street / Dundee Park Drive intersection. A design speed of 25 MPH was used, and traffic volumes were adjusted downward to average month conditions for 2023 Existing and 2030 Build. The TIA indicates that a traffic signal is not warranted under 2023 Existing or 2030 Build conditions. TEC generally concurs with the analysis parameters and results. The Applicant should provide supporting documentation showing the traffic volume adjustments in the Appendix.

Applicant Response: As noted above, the Essex Street/Railroad Street/Dundee Park Drive intersection is expected to be improved through the MassWorks project which includes cutting off Pearson Street prior to this intersection. The

traffic signal warrant analysis of the reconfigured intersection that was provided in the TIA indicated a signal was not warranted. Therefore, options to improve operations at this location are limited to changes in unsignalized control. Currently the intersection operates with Essex Street under free flow conditions. Implementing all-way stop control will deteriorate operations on Essex Street and may not improve operations for Railroad Street or Pearson Street. Due to the location of this intersection a roundabout is not feasible. Supporting documentation for the traffic volume adjustments is in the Appendix to the updated TIA.

TEC Response: TEC understands that the Mass Works project is funded and still in the design stage; however, until design is complete, and the construction is commenced, there is no guarantee that the project will be completed. With the understanding that any commitments to mitigation may be moot upon this, the Applicant should work with the Town to evaluate opportunities to modify the traffic control at this location. These enhancements may be an expansion of Mass Works improvements proposed at the location.

Comment 18: **An alternative analysis has been described in the TIA involving the removal of the Pearson Street approach at the Essex Street / Pearson Street / Railroad Street / Dundee Park Drive intersection, which has been proposed as part of the Mass Works Project. It is stated in the TIA that the traffic volumes were redistributed for the 2030 No-Build and Build conditions with analysis results shown in Table 14; however, the redistribution has not been shown in the Appendix, as stated, nor has it been described in any detail. TEC is, therefore, unable to verify the alternative analysis results.**

Applicant Response: VAI has provided redistribution figures in the Appendix of the updated TIA.

TEC Response: Comment addressed. No further response required.

Comment 19: **To further expound on Comment #18, all the study area intersections should be analyzed for 2030 No-Build and Build conditions, with and without the Mass Works project when directly affected by traffic redistribution of the project's improvements.**

Applicant Response: VAI reached out to confirm the configuration of Pearson Street prior to conducting this expanded analysis to determine if the town emergency response and public works staff preferred a two-way or one-way configuration for Pearson Street. Based on discussions with the Town Engineer, the town prefers the two-way configuration therefore, VAI assumed Pearson Street remains as a two-way street in the revised analysis. This analysis is provided in the updated TIA.

TEC Response: Comment addressed. No further response required.

Comment 20: **In a field review conducted with the Town on January 18, 2024, TEC noted that the railroad gates at the Essex Street / Pearson Street track crossing are in the down position when a commuter rail train is present at the MBTA station located further to the north on Railroad Street. Queueing and delays occur, not only on Essex Street and Pearson Street, but also on Railroad Street, Dundee Park Drive, and**

School Street, as a result. A separate sensitivity analysis should be provided for this location based on the gate closure timeframe and frequency during the peak hour periods for this location.

Applicant Response: The Project does not change the gate closure time at the railroad crossing. A sensitivity analysis that reviews the frequency of the closure, which will not change with or without the Project, is not relevant to the discussion of the Project impacts.

TEC Response: TEC disagrees with the Applicant's response. The several gate closures during the peak periods as analyzed will affect the operations at this location and are not accounted for in the TIA's operational analysis. TEC acknowledged that the Project does not change the gate closure time at the railroad crossing; however, the operational analysis evaluated in the TIA is currently not showing the correct operations if the railroad closures are not part of the evaluation. This is even more crucial as an inbound train keeps the gates down even with the train stopped at the station.

Comment 21: **TEC suggests the following additional off-site mitigation that the Applicant should evaluate in conjunction with the Town of Andover:**

- **Several unsignalized intersections have crash rates higher than the MassDOT District 4 average (0.57 per MEV). The Applicant has not offered any mitigation to address short-term / low-cost safety issues at these locations. The Applicant should work with the Town to evaluate and implement, at a minimum, short-term / low-cost safety improvement countermeasures at these key locations.**
- **The Applicant should coordinate with the Town on opportunities at 75% occupancy to reevaluate the operations at this location in the field to adjust traffic signal timings as necessary.**
- **Additional off-site mitigation should be explored and considered to improve the LOS E and F conditions noted at the several intersection locations within the study area. At a minimum, the Applicant should evaluate opportunities to modify the traffic control at this location. These enhancements may be an expansion of Mass Works improvements proposed at the location.**
- **The Applicant should explore opportunities to extend sight lines as necessary from each key driveway location, including the intersection of Lewis Street / Buxton Court, based on the resulting sight triangle described in Comments #13 and #14.**
- **The analysis indicates that the Project will result in minimal impacts to traffic at the study intersection. Is the Applicant referring only to the site driveway or to all the intersections in the TIA? As noted in Comment #17 above, there are individual movements that will experience LOS "E" and "F". The Applicant has not offered any mitigation to address these issues.**

Applicant Response: Many of the comments made here have been responded to previously. The MassWorks project is expected to address operations and safety at the intersections noted. Based on discussions with Town Staff, the town and their MassWorks consultant are working on the design and construction was indicated by Town Staff to start as early as fall 2024 or spring 2025. It should be noted that the Project was instrumental to the Town receiving the MassWorks grant that provided funds for the proposed improvements in the area.

TEC Response: Comment not addressed. TEC understands that the Mass Works project is funded and still in the design stage; however, until design is complete, and the construction is commenced, there is no guarantee that the project will be completed. With the understanding that any commitments to mitigation may be moot upon this, the Applicant should work with the Town to evaluate opportunities for off-site mitigation as noted above.

Comment 22: The Applicant should define Transportation Demand Management (TDM) to be utilized on the site. At a minimum, the Applicant should provide the following TDM considerations:

- **Seek to provide MBTA and MVRTA maps and schedules to all tenants as part of welcome packets and to locate such documents in all lobbies and entryways.**
- **Provide electric vehicle and EV-ready parking spaces within the site.**
- **Consider providing transit subsidies to tenants to encourage use of the neighboring public transportation uses.**
- **Provide weather-protected and secure bicycle parking on-site.**
- **Provide on-site laundry services if not internal to each residential unit.**
- **Provide parking for ride-hailing services on-site.**

Applicant Response: The Applicant expects to provide TDM measures for the Project. These are expected to include the following:

1. *A “Welcome Packet” will be provided to all residents and employees detailing available transportation services and facilities.*
2. *EV parking spaces will be provided at locations approved by the Andover Fire Department.*
3. *Public transportation schedules will be posted in a centralized location for residents and employees.*
4. *A pick-up/drop-off area for rideshare services is provided near the lobby area.*

TEC Response: TEC will note that the Applicant should provide reconsideration to provide weather-protected and secure bicycle parking on-site, provide on-site laundry services if not internal to each residential unit, and providing transit

subsidies to tenants to encourage use of the neighboring public transportation uses.

Comment 23: **Note that the Mass Works Infrastructure Project is in a conceptual stage and has been programmed in direct support of the subject redevelopment project. Whereas the funding and construction of the project is not guaranteed at this time, The Applicant should discuss with the Town and commit to other off-site mitigation within the limits of the Mass Works project should the infrastructure not be completed.**

Applicant Response: Based on comments from Town Staff, the town has received the MassWorks grant and their consultant has begun working on the preferred design with the start of construction identified as fall 2024 or spring 2025. The MassWorks project includes improvements to many of the intersections in the study area including the closure of Pearson Street.

TEC Response: Comment not addressed. TEC understands that the Mass Works project is funded and still in the design stage; however, until design is complete, and the construction is commenced, there is no guarantee that the project will be completed. With the understanding that any commitments to mitigation may be moot upon this, the Applicant should work with the Town to evaluate opportunities for off-site mitigation as noted above.

Comment 24: **TEC reviewed the supplemental traffic analysis for the project's effect on Elm Square. Generally, TEC concurs that the development will have negligible to limited impacts on the traffic conditions at Elm Square as much of the trip distribution to/from the site will be focused towards the high-capacity routes of I-495 and I-93 which is accessed without going through Elm Square. TEC will note that prior comments have noted modifications to be made on both the trip generation and trip distribution of the project which may result in additional operational and safety impacts to Elm Square. As part of TIA revisions noted from these comments, the Applicant should similarly evaluate the change in impacts at Elm Square.**

Applicant Response: VAI has updated the supplemental Elm Square analysis to reflect the redistribution due to the closure of Pearson Street and this is provided in the appendix of the updated TIA.

TEC Response: Comment addressed. No further response required.

Comment 25: **TEC notes that the Supplemental Traffic Analysis document for Elm Square refers to North Main Street and Main Street at Route 38 as opposed to Route 28. Further revisions to the analysis based on the above comments should update references accordingly.**

Applicant Response: VAI has made the indicated changes in the Elm Square supplemental memo, which is included in the appendix of the updated TIA.

TEC Response: Comment addressed. No further response required.

Initial Site Plan Comments

Comment 26: The Off-Street Parking Requirements (Town of Andover Zoning Bylaw, Section 8.5.9 - Off-Street Parking and Loading Areas [Historic Mill Overlay District]) require that residential uses provide one (1) space per dwelling unit minimum and two (2) spaces per 1,000 SF of non-residential uses minimum. The site will therefore require 165 off-street parking spaces for the site's residential component with an additional 7 parking spaces for the non-residential uses (800 SF of coffee shop, 2,730 SF of recreational community center, and 3,400 SF dog park). The calculations in the parking Table on Sheet C4.0 do not denote parking spaces for the gym or office uses as they are direct amenities to the residents.

The site provides 255 off-street parking spaces (76 surface spaces and 177 garage spaces) in excess of the Bylaw minimum requirements. The residential component is effectively a 1.4 spaces per dwelling ratio. Considering the direct proximity to the MBTA commuter rail and the short distance to the Downtown Andover amenities, this level of parking could be considered excessive although compliant. The Applicant should consider the reduction of parking where possible, especially in relation to the head-in parking along Pearson Street. Alternatively, the Applicant should consider the relocation of these head-in parking to another location internal to the site as to remove the head-in parking spaces along Pearson Street.

Applicant Response: The client will consider a reduction in parking and the relocation of the head-in parking to another location internal to the site.

TEC Response: The Applicant has retained the head-in parking within the plans and converted them to angled style. The closure of Pearson Street as part of the Mass Works project and construction of the raised crossing just east of the parking stalls along Pearson Street will assist in lowering travel speeds approaching from the mainline roadway. Although TEC and the Town have reservations regarding this parking, the parking style is allowed at this location and the Applicant has provided other amenities to assist with the safety challenge that is inherent with 'head-in' parking. No further response required.

Comment 27: The garage parking layout sheet of the plans should be enhanced with the location of columns and other internal obstructions which may impact parking space locations and the ability for vehicles to access/egress individual parking spaces.

Applicant Response: The structural drawing showing the location of the columns and other internal obstruction will be provided once completed.

TEC Response: The Town should consider as a condition of approval that review of the garage parking plan be completed to access the location of columns and other internal obstructions which may impact parking space locations and the ability for vehicles to access/egress individual parking spaces.

Comment 28: The garage layout sheet of the plan should be enhanced to show the location of internal access points such as elevators and stairwells to determine proximity to/from accessible parking spaces and preferential parking spaces.

Applicant Response: The Site Plan has been updated to depict the elevator and stairs on the garage level. All aisles are 24 feet width.

TEC Response: The garage layout, shown in Sheet C4.0, depicts only one (1) elevator and one (1) stair location within the garage. Please note whether this is the intent. It may be appropriate to provide additional access points considering the layout of the building above and the ease of access across the garage and across above-ground floors.

Comment 29: The overall parking layout internal and external to the building should define the locations of preferential parking spaces and other parking amenities, such as electric vehicle charging stations and spaces that will be designated as EV-ready.

Applicant Response: Sheet C-4.0 of the Site Plan depicts the compact cars spaces and handicap spaces. The individual garages on the building frontage have EV chargers, the plan has been updated to depict that.

TEC Response: Acknowledged. It appears the four (4) designated accessible parking spaces within the garage are set far from both the internal elevator and stairwell requiring a person with accessible needs to travel far across and through other parking stalls to get to these locations. This should be corrected.

Comment 30: The two (2) accessible parking spaces at the northwest corner of the site are located at the far end of the lot approximately 200-feet from the nearest building entryway. The Applicant should relocate accessible spaces to close proximity to building entryways and provide all necessary infrastructure, such as accessible ramps, along the path of travel as needed.

Applicant Response: The accessible parking spaces located at the northwest corner of the site are intended to be accessible spaces for the dog park, not for the main building. The accessible spaces for the building residents are in the garage.

TEC Response: Comment addressed. No further response required.

Comment 31: Whereas the Applicant has noted that the head-in parking along Pearson Street is generally for the use of the recreation center, there are no specific accessible spaces provided for this head-in parking area, if retained.

Applicant Response: The parking along Pearson Street follows the road topography, having a slope of approximately 6.3%, which is too steep for an accessible space. The accessible parking spaces for the courtyard area and community building are in front of the courtyard area.

TEC Response: Comment addressed. No further response required.

Comment 32: The exhibit shows the apparatus entering, circulating the site, and exiting through both driveways. The vehicle can enter and exit both access points and circulate the internal roadway; however, there would be encroachment into opposing travel lanes at the access points and internally at the northwest corner of the site. TEC defers to the Town of Andover Fire Department to verify whether the dimensions of their fire trucks match the dimensions used in the turning analysis.

Applicant Response: Lt. Ryan T. Beal, Fire Prevention Officer for Andover Fire Rescue indicated on March 6, 2024 in an email to Leticia Oliveira of MC that the swept path analysis is acceptable.

TEC Response: Comment Closed. No further response required.

Comment 33: The Applicant should coordinate with the Town of Andover Fire Department for preferred locations of fire lanes (if needed), confirmation of on-site hydrant locations (if needed), and sign requirements for fire lanes within the site.

Applicant Response: Lt. Beal also indicated on March 6, 2024 in an email to Leticia Oliveira of MC that the hydrant locations are acceptable. Fire lanes have been added to the design, MC met with Lt. Beal on March 14, 2024 to review plans and he is satisfied with the design.

TEC Response: Comment Closed. No further response required.

Comment 34: The Applicant should provide turning templates showing the ability of refuse trucks to access, circulate, and egress the site through the circulation pattern without leaving the paved surface while providing access to the dumpster enclosures on the site.

Applicant Response: VAI has provided turning templates for the refuse vehicle requested in the appendix to this letter. There are no dumpster enclosures; instead, dumpsters will be wheeled out of the garage for pickup from the lower circulating roadway.

TEC Response: Comment Closed. No further response required.

Comment 35: The Applicant should provide turning templates showing the ability of the standard delivery vehicle or service vehicle to be utilized on-site to access, circulate, and egress the site through the circulation pattern without leaving the paved surface and while providing access to the secured receiving area. The Applicant should confirm that this is or is separate from the 'drop-off' area at the southwest end of the building.

Applicant Response: VAI has provided turning templates for the moving and delivery vehicles requested in the appendix to this letter. These paths depict vehicles utilizing the drop-off area near the building lobby as well as the loading area at the north end of the building.

TEC Response: Comment Closed. No further response required.

Comment 36: **The Applicant should provide a dedicated area for package deliveries to the mail room or individual units (U.S. Mail, Amazon, FedEx, etc.) and confirm there is sufficient room for bypassing resident traffic.**

Applicant Response: *The mail room is located on the southwestern corner of the building. There is a drop-off area located next to the southwestern corner of the building that will be used for passenger ride share drop-off and for deliveries. The plan has been updated to clarify that.*

TEC Response: Comment Closed. No further response required.

Comment 37: **The site plans should denote the limits of all off-site pedestrian and bicycle accommodation work off-site.**

Applicant Response: *Sharrows have been added on Pearson Street, Buxton Court and on proposed driveway to indicate to drivers to share the road with the bicyclists. The concrete sidewalks shall be for pedestrian use only.*

TEC Response: Comment Closed. No further response required.

Comment 38: **The Applicant should denote the designated locations of secure and weather protected bicycle storage within the building and/or as part of the courtyard area.**

Applicant Response: *The bike storage for residents is inside the garage.*

TEC Response: Comment Closed. No further response required.

Comment 39: **The two-way drive aisle along the westerly property line ranges from 20-feet to 24-feet whereas the Bylaw denotes a 24-foot minimum width for two-way drive aisles. This is especially important at the proposed garage bays on the west side of the building. The Applicant should rectify or provide justification for a variance.**

Applicant Response: *This project was designed under the Historic Mill Overlay District (HMOD) Section 8.5 of the Andover Bylaw). According to section 8.5.2 of the Bylaw, the overlay district is superimposed over the underlying zoning districts and “the requirements of the underlying zoning districts shall remain in full force and effect, except for Projects undergoing development pursuant to section 8.5”. The HMOD does not have requirements for driveway width; therefore, a rectification or variance should not be necessary. The HMOD has Design Objectives (section 8.5.7) which the project complies with, such as “safe vehicular and pedestrian ways, and minimize traffic impacts”, minimize the visual impact of parking areas” and “Assure safe interior circulation within its site by separating pedestrian, bike, and vehicular traffic”.*

TEC Response: Comment Closed. No further response required.

Comment 40: **The bottom of all traffic signs on-site should be a minimum of 7 feet above the ground surface per the *Manual on Uniform Traffic Control Devices (MUTCD)* when directly impeding sidewalks or travel paths.**

Applicant Response: *Comment noted. The signs will not obstruct sidewalks or travel paths, however, the “Sign Post” detail on Sheet C8.5 has been revised to depict this requirement.*

TEC Response: Comment Closed. No further response required.

Comment 41: **Notes should 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 windrows located within sight triangle areas that exceed 3.5 feet in height or that would otherwise inhibit sight lines shall be promptly removed.” All permanent and temporary (such as unit/tenant advertisements) signs should be located outside the sight line triangles.**

Applicant Response: An updated sight triangle plan is provided as Sheet C4.2 provided to address this comment.

TEC Response: Comment Closed. No further response required.

Comment 42: **There may be changes to the Pearson Street access/egress depending on the Mass Works Project and alternate plans to remove the Pearson Street approach from its intersection with Essex Street. TEC will comment on this further if plan changes are submitted for review.**

Applicant Response: No response required.

TEC Response: Comment Closed. No further response required.

Comment 43: **There are discrepancies between the TIA and Plan Sheet C4.2 for the sight distance measurements shown at the Pearson Street access driveway.**

Applicant Response: The TIA reflected existing conditions sight distances while Sheet C4.2 reflected proposed conditions. However, due to changes noted previously, Plan Sheet C4.2 was updated.

TEC Response: Note that the same discrepancy exists where the TIA responses to comment Figure SD-1 denotes 150-feet and the plan sheet C4.2 denoted 140-feet.

Comment 44: **The parking area on Pearson Street adjacent to the proposed community building will limit sight distance to the east. The Applicant should eliminate or limit the amount of parking to address this issue. Note that the sight line triangles must not cross through these parking spaces. What opportunities exist to relocate to the site? Note that the overall amount of parking spaces does exceed zoning minimums.**

Applicant Response: The parking area on Pearson Street has been updated to improve sight distance from the site driveway. This is shown in the appendix to this letter and revised Plan Sheet C4.2.

TEC Response: Comment Closed. No further response required.

Comment 45: **The Applicant should provide roadway/driveway profiles and confirm ADA/AAB compliance for these elements and internal sidewalks around the building or seek a variance for the project, if necessary, as the slope for the corridor exceeds typical ADA/AAB compliance.**

The plans and the construction details show that all new sidewalks are to be a minimum of 5 feet wide, excluding the width of any curbing, which is acceptable to TEC.

Applicant Response: The existing sidewalk along Pearson isn't ADA compliant. The proposed sidewalk is ADA compliant; the proposed slope is 5%.

TEC Response: Comment Closed. No further response required.

Comment 46: It appears that guardrail (type unspecified) is proposed on site at the parking areas adjacent to the MBTA property. Details have not been provided in the plan set.

Applicant Response: A guardrail detail has been added to the Detail Sheet C8.5.

TEC Response: Comment Closed. No further response required.

Comment 47: Although snow storage areas are shown on the plan, the Applicant should provide a snow removal and parking management plan for Town staff review.

Applicant Response: We suggest that as a condition of approval to be attained prior to the issuance of a Building Occupancy Permit.

TEC Response: TEC agrees that a snow removal and parking management plan should be, at a minimum, provided as a condition of approval to be attained prior to the issuance of a Building Occupancy Permit.

NEW Comments

Comment 48: As the Applicant is relying heavily on the various trip credits for mode split, public transportation use, and internal capture, the Applicant should commit to a traffic monitoring program to ensure that the Project impacts are consistent with those predicted in the Project's permitting process, evaluate the effectiveness of the TDM measures in meeting the mode share targets, and assess the need for additional off-site improvements or TDM measures. As part of the monitoring program, the Applicant will complete the following tasks following 70% occupancy of the residential building and following full occupancy of the proposed mixed-use tenants:

- **Collect manual Turning Movement Counts (TMCs) during the weekday morning (7:00 AM to 9:00 AM) and weekday evening (4:00 to 6:00 PM) at the following intersections:**
 - **Route 28 / Lewis Street**
 - **Route 28 / Person Street**
 - **Route 28 / Elm Street [Elm Square]**
 - **Railroad Street / Essex Street / Dundee Park**

- **Collect ATR data for a continuous 7-day week-long period along each Buxton Court and Pearson Street positioned at locations to capture site related trips only.**
- **Collect parking demand counts during the peak parking demand periods for the specific land use areas, including:**
 - **Residential - 5:00 AM to 9:00 AM;**
 - **Other Site Uses - 10:00 AM to 1:00 PM; and**
- **Collect motor vehicle crash reports from the Town of Andover Police Department for the most recent one-year period to ascertain changes in crash frequency, crash trends, and severity at the monitored locations.**
- **Compare the TMCs collected above with those projected within the TIA for the Project to determine whether the total vehicles entering each intersection exceeds the volumes projected.**
- **Perform a capacity and queuing analysis using Synchro analysis software to evaluate the traffic operations at each of the intersections listed above and compare to the operations projected in the TIA prepared for the Project.**
- **Assess whether additional mitigation is necessary at any of the study intersections and identify measures to improve operations and/or reduce vehicular traffic volumes. The need or evaluation for further mitigation will be conditioned upon:**
 - **The measured site generated traffic volumes for the Project exceed the projected site generated traffic volumes established in this TIA, or subsequent revisions as presented to the Town of Andover, by more than 10 percent (i.e., 110 percent of the projected site generated traffic volumes.**
 - **One or more of the movements at the monitored intersections is identified to be operating at or over capacity (defined as a V/C ratio equal to or exceeds 1.00).**
 - **There is a pronounced increase in the frequency of occurrence of motor vehicle crashes at a monitored location and the calculated motor vehicle crash rate exceeds the MassDOT average crash rate for similar locations.**

Corrective actions to reduce the unmitigated impact of the Project should be proposed and implemented based on the thresholds listed above. The corrective actions should be documented in the TMP, approved and coordinated with the

Town if desired; and be undertaken by the Applicant subject to receipt of all necessary rights, permits, and approvals.

- **Assess whether the constructed parking supply is adequate for the parking demand as observed; and**
- **Prepare a memorandum summarizing the results of the TMCs, ATRs, parking demand counts, traffic impact analysis for submission to the Town of Andover.**

Please do not hesitate to contact me or John Gregg if you have any questions concerning this peer review at 978-794-1792. Thank you for your consideration.

Sincerely,
TEC, Inc.
“*The Engineering Corporation*”



Samuel W. Gregorio, PE, PTOE, RSP1
Project Manager – Transportation Planning & ITS