

Mr. Theo Kindermans
Chair, Concord Zoning Board of Appeals
Town of Concord
141 Keyes Road, 1st Floor
Concord, Massachusetts 01742

October 17, 2023

Ref. T1384

Re: Business/Residential Use – 166 Commonwealth Avenue - Concord, Massachusetts
Transportation Peer Review

Dear Mr. Kindermans

On behalf of the Town of Concord, TEC, Inc. (TEC) has reviewed documents as part of the transportation engineering peer review for the proposed redevelopment of the parcel located at 166 Commonwealth Avenue in Concord, Massachusetts. The project site, shown on Parcel #2184-2, is located within the West Concord Business zoning district. The parcel is currently occupied by a single 2,982 square foot (SF) service station facility, formerly a gas station. The Applicant proposes to demolish the existing service station building and remove the existing underground fuel storage tanks while replacing it with a 23,609 SF building comprised of 1,110 SF of first-floor retail and twelve (12) residential units. The residential component will include four (4) three-bedroom units, six (6) two-bedroom units, and two (2) one-bedroom units.

The following documents were reviewed as part of our review:

- Amended ZBA Materials / Application Narratives - *166 Commonwealth Avenue - Concord, Massachusetts*; prepared by 166 Commonwealth Avenue, LLC; dated September 14, 2023
- *Transportation Impact and Access Study – Proposed Redevelopment – 166 Commonwealth Avenue - Concord, Massachusetts*; prepared by VHB, Inc.; dated September 21, 2023
- *Response to Town Comments – Building Permit Plan – 166 Commonwealth Avenue - Concord, Massachusetts*; prepared by Spruhan Engineering, PC; dated September 13, 2023
- *Architectural Plan – New Combined Retail and Residential - 166 Commonwealth Avenue - Concord, Massachusetts*; prepared by Spruhan Engineering, PC; dated September 7, 2023
- *Civil Plan - 166 Commonwealth Avenue - Concord, Massachusetts*; prepared by Spruhan Engineering, PC; dated September 13, 2023

TEC completed a review of these documents for the Town of Concord, and the following provides a summary of the comments we compiled during our review. For the purpose of this review, the Commonwealth Avenue roadway segment tangent through West Concord Center will be referred to as Commonwealth Avenue [East] and the roadway segment connecting to the Concord Roarty will be referred to as Commonwealth Avenue [North] for ease of reference. The connection

roadway between Commonwealth Avenue [North] and Law Brooks Road on the westerly side of the triangle will be referred to as the Comm Ave Connector for ease of reference.

Transportation Impact and Access Study

- 1.) The Traffic Impact and Access Study (TIAS) includes a study area of intersections including the three triangle intersections of Commonwealth Avenue / Law Brooks Road and the intersection of Commonwealth Avenue [East] / South Site Driveway. TEC generally concurs with the scope of the study area intersections based on the Massachusetts Department of Transportation (MassDOT) *Traffic Impact Assessment (TIA) Guidelines* (Section 3.I.C) to evaluate intersections in which the site-generated trips increase the peak hour traffic volume by more than 5 percent and/or by more than 100 new vehicles per hour.
- 2.) Existing traffic volumes at the study area intersections were collected on Thursday, March 30, 2023 while area schools were in general session. Traffic volumes at the location were unadjusted seasonally based on comparisons to the most recent seasonal adjustment factors issued by MassDOT, issued in 2019, for the month of March. TEC concurs with the usage of existing traffic volumes.
- 3.) The TIAS does provide crash history which generally shows a limited number of reported crashes in the vicinity of the study area including no intersection or roadway locations that are noted as Highway Safety Improvement Program (HSIP) eligible. Although the information in the Appendix is limited as to the crash narrative, it appears two crashes may be related to the existing site driveway locations: including, one at each driveway. TEC generally concurs that the overall level of crash history does not indicate any specific crash trends; however, the Applicant should provide more specific information as to the crashes at the site driveways and related to the movements in/out of the site driveways.
- 4.) The TIAS references a 1.0% growth rate on traffic volumes per year (compounded) to be consistent with other traffic studies in the area. This would be higher than the 3-year running average (2016-2019) based on historical MassDOT data for urban major collectors (0.53% per year). TEC generally concurs that the growth rate of 1.0% as used by the TIAS.
- 5.) The TIAS documents three (3) specific developments by others which are anticipated to contribute additional traffic to the study area which are not accounted for in the March 2023 traffic counts.
- 6.) The TIAS traffic volume progression from 2023 Existing to 2030 No-Build to 2030 Build utilizes rounded volumes, to the nearest 5 vehicles, for use in the capacity and queue analysis. Therefore, the numbers as shown in traffic networks, or the analysis may be slightly off from the specific calculations from the traffic counts within the traffic volumes progression by up to 5 vehicles. Where volumes below 5 vehicles exist, the TIAS has used that specific traffic volume and associated factors. Overall, the rounding of traffic volumes is insignificant to the results of the analysis.
- 7.) The TIAS estimates the existing trip generation to/from the service station based on the traffic volumes collected in March 2023 which indicates that the existing site generates 38 vehicle trips during the weekday morning peak hour and 34 vehicle trips during the weekday evening peak hour. TEC questions the number of trips reported to/from the "Mobil Driveway" along Commonwealth Avenue [East] which accounts for 35 of 38 trips

- during the weekday morning peak hour and 29 of 34 trips during the weekday evening peak hour. The gas station is not operational, and the service station has only two (2) bays, which seems unlikely to support this level of existing traffic. The Applicant shall confirm that the “Mobil Driveway” traffic counts does not also include the driveway traffic to/from the abutting #152 Commonwealth Avenue which shared an open curb cut with the project site and whose traffic breakdown would not be necessarily discernable by traffic count without checking video back-up vehicle-by-vehicle. Note that traffic related to #152 Commonwealth Avenue would remain following construction of any new project at #166 Commonwealth Avenue. Should credit be given for the existing land use, the Applicant shall confirm the existing trip generation is accurate.
- 8.) Site trip generation calculations for the proposed retail/residential development were generated based on standard trip rates published in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 11th Edition* for Land Use Code (LUC) 220 – Multifamily Housing Low-Rise and LUC 822 – Strip Retail Plaza. Furthermore, the TIAS outlines the progression of trip generation attributes for internal capture, pass-by trips, to determine the total number of new vehicles trips and the net number of vehicles trips over existing conditions. In addition, the TIAS provides the progression of trip generation attributes for person trips to determine the level of walking, biking, and public transportation use. Overall, the project is anticipated to result in 222 new vehicle trips during the typical weekday with eight (8) new trips during the weekday morning peak hour and ten (10) new trips during the weekday evening peak hour. TEC can not confirm the net trip generation as noted in Table 9 without confirmation of data reflected in Comment #7.
 - 9.) The distribution of site related traffic was derived from the Turning Movement Counts (TMC) as opposed to land use specific gravity models. As the overall level of new traffic to the roadway is limited, TEC would note that the application of a site-specific gravity model would have negligible effect on the capacity and queue analysis.
 - 10.) The TIAS indicates that due to the limited on-site parking, all of the net vehicle trips were assumed to use the Site driveways while the pass-by trips were assumed to use the on-street parking on Commonwealth Avenue to the east of the Site. TEC notes that only four (4) retail spaces are designated on site of which some are expected to be occupied on a consistent basis by employees of the retail and two (2) spaces overall are accessible and may not be utilized at all times. As the TIAS and the Applicant has noted the use of on-street parking in line with Bylaw Section 7.7.2.12, the Applicant, at a minimum, should provide information as to the surrounding on-street parking demand and supply if justification for relief is to utilize on-street parking. Note that some on-street parking patterns may be interrupted in the current timeframe based on sidewalk and roadway construction along Commonwealth Avenue. Any parking demand and supply related study should not occur until sidewalk and roadway construction is completed. If on-street parking is insufficient due to current use, the Applicant should revise the TIAS to place pass-by related trips to/from the subject site driveways.
 - 11.) TEC generally agrees that the project will have little impact to the traffic network regarding traffic operations; however, the location of site driveways in close proximity to the intersection of Commonwealth Avenue / Law Brooks Road is concerning as sight lines may not be available from both the Site Exit Driveway along Commonwealth Avenue [North] and the South Site Driveway along Commonwealth Avenue [East]. In addition, the Applicant has noted the implementation of right-out only from the Site Exit Driveway; but

has not provided any geometric conditions to the driveway on the site plans that indicate that left turns would be restricted. At a minimum, the driveway should be reconfigured to force exiting traffic to turn right whereas traffic signage only is difficult to enforce.

- 12.) The TIAS indicates that the sight distance requirements for stopping sight distance (SSD) and desired for intersection sight distance (ISD) were assessed based on an 85th percentile speed of 25 miles per hour (mph). The Automatic Traffic Recorder (ATR) counts provided in the Appendix for Commonwealth Avenue near the Mobil Driveways was presented as 35 mph in both the northbound and southbound direction. The required SSD for 35 mph is 250-feet and the desired ISD is 390-feet.
- 13.) The TIAS does not provide sight distance information for the Site Exit Driveway. This should be provided understanding that the driveway is proposed as a right-out driveway. TEC field measurements based on an approximation of site related infrastructure suggests:
 - a. The sight line for the SSD along Commonwealth Avenue northbound to the Site Exit Driveway appears to cross through the site and is limited by the off-street parking space labeled "Parking Spot #1". The sight line appears to be restricted to approximately 210-feet, well below the AASHTO minimum required.
 - b. The sight line for the ISD along Commonwealth Avenue northbound to the Site Exit Driveway appears to similarly cross through the site and is limited by the off-street parking space labeled "Parking Spot #1" and on-street parking along Commonwealth Avenue. The sight line appears to be restricted to less than 200-feet, well below the AASHTO minimum required.

The Applicant shall provide sight distances measurements for the Site Exit Driveway taking into account the location of on-site parking stalls and on-street parking stalls.

- 14.) The ISD looking east from the South Site Driveway seems to be reported as longer than actually available in Table 12. On-street parking along the northerly side of the roadway appears to restrict the sight line to approximately 120-feet, well below the AASHTO minimum required and well below as reported in Table 12 of the TIAS. The Applicant shall reevaluate sight distances measurements for the South Site Driveway taking into account the location of on-site parking stalls and on-street parking stalls.

Civil Plans / Architectural Plans

- 15.) The Architectural Plans indicate that the trash room of the building is located at the inside corner of the building within the project's parking field. 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 or conflicting with parking spaces.
- 16.) The Applicant should provide turning templates showing the ability of fire apparatus to access, circulate, and egress the site through the circulation pattern without leaving the paved surface. This includes a Town of Concord fire apparatus.
- 17.) The Applicant should coordinate with the Town of Concord Fire Department for preferred locations of fire lanes (if needed), confirmation of hydrant locations, and sign requirements for fire lanes within the site.

- 18.) The proposed site provides for fourteen (14) off-street parking spaces, twelve (12) standard parking spaces, and two (2) accessible spaces. The land uses are both identified in Bylaw Section 7.7.2.1 Table IV of Minimum Parking. The site would require twenty-eight (28) parking spaces to satisfy the Bylaw. The Applicant has noted a need for relief from parking spaces citing in the Application Narrative that recent Brookside Square development with 1.5 spaces per unit and the proximity to the Massachusetts Bay Transportation Authority (MBTA) Commuter Rail.
- a. TEC would generally agree that a reduced parking supply from the Zoning Bylaw may be justified with proper justification and back-up data. Where the Application Narrative notes the 1.5 spaces per unit constructed by the neighboring Brookside Square Development, note that the subject development is effectively proposing 0.83 spaces per unit. This is well below even that of Brookside Square.
 - b. The off-street parking supply for the development includes two (2) accessible spaces which, if not utilized by patrons or residents by need by an accessible patron or resident, effectively results in only twelve (12) usable parking spaces by both the retail and the residential components of the site. With a small parking supply, unused accessible spaces are not absorbed by the overall parking supply similar to larger development. If even one (1) of these spaces is directed towards each land use, the effective parking supply for twelve (12) residential units would now be nine (9) parking spaces or 0.75 parking spaces per unit.
 - c. Parking demand calculations published by the Institute of Transportation Engineers (ITE) in the most recent industry standard *Parking Generation, 5th Edition* for Land Use Code (LUC) 221 – Multifamily Housing Mid-Rise denote an average peak parking demand of thirteen (13) parking spaces needed for twelve (12) units or twenty (20) parking spaces for twenty-six (26) bedrooms. Parking demand calculations also note an 85th percentile peak parking demand of fifteen (15) parking spaces needed for twelve (12) units or twenty-three (23) parking spaces for twenty-six (26) bedrooms. The above referenced parking demand values are based on location within ½-mile of rail transit similar to the subject Project. The 1,100 SF retail component would denote an average peak demand of two (2) parking spaces and an 85th percentile peak demand of four (4) parking spaces. Even under the most limited parking demand combination from the ITE publication would suggest the Applicant's parking spot count would be insufficient to meet demand. The Applicant shall provide further justification for the limited parking supply on-site.
 - d. Relief from off-street parking requirements, as defined in Bylaw Section 7.7.2.12 indicates that the Applicant may receive relief from the Board on the number of parking spaces if (c) *the distance and availability of on-street parking, public parking facilities and alternative transportation*. On-street parking and public transportation uses are in close proximity to the proposed site. TEC does note that the parking demand estimates described in the above-mentioned bullet do somewhat account for the proximity to rail transit. The Applicant, at a minimum, should provide information as to the surrounding on-street parking demand and supply if justification for relief is to utilize on-street parking. Note that some on-street parking patterns may be interrupted in the current timeframe based on sidewalk and roadway construction along Commonwealth Avenue. Any parking

demand and supply related study should not occur until sidewalk and roadway construction is completed. See TEC Comment #10.

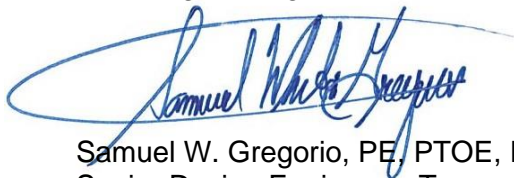
- e. Whereas retail related parking demand is more apt to use on-street parking or be shared with other destinations along Commonwealth Avenue within West Concord Center, parking demand for the residential use is more apt to require parking on-site or off arterial roadway on-street parking. Where adequate justification for the limited parking supply is not met, the Applicant should provide clear restrictions to the allowance of site related parking on neighboring streets and to the nearby Rideout Park / Playground.
- 19.) As the off-street parking is to be shared between the retail and residential use, the Applicant should note if assigned parking will be applied to each parking spaces. If so, will spaces be signed or marked as such. If so, the Applicant should provide notation and locations for all signage and pavement markings related to the parking supply.
 - 20.) Dimensions are provided for a typical parking space on-site in compliance with Bylaw Section 7.7.3.1. In addition, dimensions for the accessible spaces on-site are in compliance with 521 CMR 23.4.1. The Applicant should revise the plans to show accessible signage at the head of each accessible parking space with the associated 'Van Accessible' plaque.
 - 21.) "Parking Spot #1" as denoted on the plan is located in close proximity to the driveway entry point along Commonwealth Avenue. The Applicant shall provide a turning template for a pick-up truck to safely back-out of this parking space to travel towards the site exit driveway without crossing over the public sidewalk through the driveway.
 - 22.) The plan shows two (2) electric vehicle charging stations on-site. The Applicant should clarify if additional spaces on-site will be constructed as EV-ready. Note that although the TEC and the Town agree with the installation of EV charging station, the limited parking supply may render these spaces unused based on the resident and/or patron mix. The Applicant should provide clarification as to the usage of these spaces if no resident, employee, or patron has an EV vehicle where the parking supply is being proposed as less than 1.0 space per unit.
 - 23.) In relation to the limited parking supply, the Applicant should provide information as to on-site locations for both rail-hailing (e.g. Uber / Lyft) and package delivery services (e.g. Amazon vans).
 - 24.) The plans should be revised to depict both intersection sight distance and stopping sight distance measurements for both directions at Commonwealth Avenue. Intersection sight distance measurements should be taken from a point 14.5-feet from the proposed edge of travel way Commonwealth Avenue. The sheet should denote all areas of clear view and resulting from the sight lines both on the public ROW and land under the control of the Applicant. Note that on-site and on-street parking spaces may hinder the length of the sight distance at and from each site driveway.
 - 25.) Where sight distances are not met, as described in Comments #13 and #14, the Applicant should reconsider the location of the proposed driveways to locations on the site to allow for minimum sight lines to be met. In lieu of this, the Applicant should consider other measures to meet minimum sight lines, such as relocation of on-site parking stalls, addition turn restrictions to/from the driveway(s), etc.

- 26.) The Applicant shall provide a dedicated plan for all traffic signage and pavement markings to be installed as part of the project. A sign summary shall also be included which depicts the sign legend, sign size, and sign lettering dimensions in compliance with the *Manual on Uniform Traffic Control Devices (MUTCD)*.
 - a. This includes the placement of a stop sign along the exit driveway at its intersection with Commonwealth Avenue.
 - b. This includes 'Do Not Enter' signage facing into the site at the entrance driveway along Commonwealth Avenue.
 - c. This includes 'No Left-Turn' or similar signage at the site exit driveway. Will this sign be on the same post as the stop sign?
 - d. This includes pavement markings, as necessary to reinforce the one-way nature of the site circulation drive aisle.
 - e. This includes all parking, accessible parking, and loading related signage.
- 27.) The Applicant should provide standard details and/or notes that denote the height of traffic signage on-site. Note that the height of some signage will be different than others.
- 28.) The pavement at the back of each proposed parking space appears to be unchanged from the existing condition leading directly into the pavement for the #152 Commonwealth Avenue property. The Applicant shall provide detail onto measure to ensure that parked vehicles on-site will not overlap into the abutting property. An example maybe the installation of wheel / curb stops.
- 29.) Concrete sidewalks are provided along Commonwealth Avenue at the site frontage and between the sidewalk and building doorways; however, the site plan does not depict direct pedestrian connection from this walkway to the parking field. The Applicant should denote the location of curbing, accessible ramps, and any layout features for the accommodation of pedestrians to/from the parking field.
- 30.) The Applicant has denoted the reconstruction of sidewalk along the Commonwealth Avenue site frontage. The site plans should be revised to denote the limits of sidewalk work, the layout configuration of all accessible ramps to Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) / Public Right of Way Accessibility Guidelines (PROWAG) standards, and layout features of the site driveways such as curbing and grading. This includes sidewalk and accessible ramps off-site at the intersection of Commonwealth Avenue / Law Brooks Road that the Applicant has committed to in the plans at the direction of the Engineering Department. The Applicant shall provide the Board with the current status of discussion on the full extent of off-site work to be completed here and the responsible party. Prior to any approval, the Applicant and the Town shall have agreements in place for this work and any land swap that is required to complete this work and work on-site.
- 31.) The Architectural Plans show an accessible ramp and crosswalk at the north end of the site at the end of the walking path adjacent to the Nashoba Brook. There is no receiving ramp or sidewalk on the far side of Commonwealth Avenue at this location. This ramp and crosswalk do not appear on the site plans. Is it the intention of the Applicant to construct this? If so, the Applicant should provide plans and construction details as to the ramp, crosswalk and opposing sidewalk landing / ramp.

- 32.) The plans show a walking path along the Nashoba Brook connecting to other walkways beyond the property line. The Applicant shall provide cross-access easement documentation for his walkway for use by the public and connecting to the sidewalk along Commonwealth Avenue.
- 33.) The Applicant should provide details as to the permeable pavement and any maintenance requirements for said surface areas.
- 34.) The Applicant should provide standard details for all accessible ramp types. This includes accessible ramps off of the site frontage that the Applicant has committed to in the plans at the direction of the Engineering Department. This includes the designation of EJ Cast Iron detectable warning panels consistent with West Concord Center.
- 35.) The Applicant should provide additional detail for dimensions and grading for the main entry area along Commonwealth Avenue. The Applicant should also provide detail as to any railings necessary for the location based on the slopes and grade change configuration of the associated ramp.
- 36.) The Applicant should provide a standard detail for the application of crosswalks to the Town of Concord standards for the vicinity.
- 37.) The Applicant should clearly denote on the plans the areas of full depth pavement reconstruction of Commonwealth Avenue, any other roadway works other than noted in various comments, and the responsible party. TEC understands that work related to the intersection configuration is being discussed as part of a public-private partnership. TEC reserves the right for additional comments as new information arises related to the off-site transportation work.
- 38.) The plans depict bicycle storage on the northerly end of the building near the entryway both inside and outside. The Applicant shall define the features of the bicycle storage including weather-protection and security, especially for the external storage location.

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

Sincerely,
TEC, Inc.
"The Engineering Corporation"



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