

Ms. Elizabeth Hughes
Town Planner
Town of Concord
141 Keyes Road
Concord, Massachusetts 01742

May 25, 2021

Ref.: T1108

Re: Traffic and Transportation Engineering Peer Review
250 Old Bedford Road – Concord, Massachusetts

Dear Ms. Hughes:

On behalf of the Town of Concord, TEC, Inc. (TEC) reviewed documents as part of the traffic and transportation engineering peer review for the proposed childcare facility to be located at 250 Old Bedford Road in Concord, Massachusetts. Concord Children's Center (the "Applicant") submitted the following documents which TEC reviewed for conformance with the Town of Concord Zoning Bylaws and generally accepted industry standards:

- *Traffic Impact and Access Study – Proposed Concord Children's Center – 250 Old Bedford Road – Concord, Massachusetts*; prepared by Bayside Engineering, dated February 10, 2021;
- Site Plan entitled "*Concord Children's Center at 250 Old Bedford Road – Concord, Massachusetts*;" prepared by Stamski and McNary, Inc.; dated March 30, 2021.

Upon review of the documents and plans, TEC has compiled the following comments for the Board's consideration:

Traffic Impact and Access Study

1. The traffic study area includes two (2) intersections in the vicinity of the site. Based upon the size and scope of the development, the proximity to the other outlying intersections, and the site's trip generation, TEC finds that the study area as provided in the TIA may not be sufficient to capture the effects of the project on surrounding roadways based on Traffic Impact Assessment (TIA) guidelines set forth by MassDOT. This includes an evaluation of intersection in which the site-generated trips increase the peak hour traffic volume by more than 5 percent and/or by more than 100 vehicles per hour per MassDOT's *TIA Guidelines* (Section 3.I.C). The Applicant should at a minimum provide a calculated value of % impact for the intersection of Old Bedford Road / Bedford Street (Route 62) and Old Bedford Road / Lexington Road based on the proximity and number of site generated trips distributed to those intersections. If an impact of greater of 5% persists, the Applicant should provide additional operational analysis and site related mitigation as warranted.
2. The traffic study does include a detailed evaluation of the site's exit driveway along Old Bedford Road but does not provide any evaluation of the site's entrance driveway along Virginia Road. The Applicant, at a minimum, should provide future year evaluation of this location to ensure queues along Virginia Road are not detrimental and whether turn lanes may be warranted.

3. The Applicant has provided traffic data collection within the study area based on counts completed prior to the onset of the COVID-19 pandemic. TEC agrees, therefore, that no pandemic related adjustment to traffic volumes is warranted. Based on the additional locations described in Comment #1, the Applicant may be well served to recount the intersection of Old Bedford Road / Virginia Road along with counts at these two new locations to provide a potential adjustment for reduction of traffic related to COVID-19.
4. The TIAS utilizes a seasonal adjustment factor of 2% based on the average of counts stations 403 and 4065; both along Route 2 within Concord. TEC concurs with the methodology and the data provided by the Applicant.
5. The safety analysis section for the report covers the recent crash history of the study intersections. The data appears to be missing a crash that occurred on October 18, 2019. Although this crash is missing from the data, the presence of only two crashes at these two intersections generally reflects no specific crash trend. Further crash analysis should be conducted for additional study area intersections if warranted.
6. The TIAS identifies a 1.0 percent per year growth rate of traffic, double the projections from the Central Transportation Planning Staff (CTPS) estimates. TEC concurs with the methodology and the data provided by the Applicant.
7. The TIAS identified additional traffic to the roadway based on a proposed three (3) dwelling unit project at #430 Old Bedford Road. The level of impact for three units is generally negligible; however, the Applicant has projected traffic on the roadway for these units based on industry standard trip methodology (ITE fitted curve) resulting in a conservative number of peak hour trips. TEC has no objection to the methodology utilized.
8. TEC has reviewed the Applicant's trip generation methodology which uses the more conservative value for each peak period between empirical data and ITE data. TEC concurs with this methodology.
9. The distribution of traffic was based on the addresses of the current student population as provided by the Concord Children's Center. No specific data was provided in the Appendices; however, based on the sensitive nature of the information, TEC will assume that the data as presented in the TIAS is correct.
10. The comments as noted above may result in modifications to the results of the capacity and queue analysis and therefore TEC reserves the right to provide additional comments and improvement recommendations upon completion of the peer review comment responses.
11. The capacity and queue analysis analyze of the unsignalized intersections using the Highway Capacity Manual (HCM) 2010 methodology instead of the current industry standard HCM 6th Edition methodology. Although TEC does not necessarily expect a significant difference with the usage of 2010 methodology, the Applicant should provide specific justification for its use over HCM 6th Edition, such as a specific parameter that is preventing the use of recent HCM methodology.
12. Movements from Virginia Road at its intersection with Old Bedford Road are anticipated to increase from level-of-service (LOS) C to LOS D during both the weekday morning and weekday evening peak hours. Although the level-of-service designation does reduce, the delay per vehicle reported increases by no more than 6 seconds between the No-Build and Build condition. The change in level-of-service occurs because the delay during the No-Build condition is currently at the LOS C/D threshold. Since the delay increases by no more than 6

seconds per vehicle, the maximum queue increases by one vehicle or less, and the volume-to-capacity (v/c) ratio is well below 1.00 during both the weekday morning and weekday evening peak hour, the impact of the project on the intersection is generally negligible for the stop-controlled approach.

13. TEC concurs that the overall, the project is not expected to significantly cause noticeable new impact to each study area intersection reported. This comment is subject to change based on response to Comment #1.
14. Sight distance measurements provided by Bayside Engineering show that sight lines to the north and south of the exist driveway are in excess of AASHTO recommendation for the 85th percentile speeds as measured by the Automatic Traffic Recorders (ATRs). At a minimum, the Applicant should commit to clear vegetation, in coordination with the Town, along the westerly side of Old Bedford Road and southerly side of Virginia Road within the Town's right-of-way to ensure sight lines are continuously met. This is noted in the TIAS.
15. The Applicant should commit to a formalized pick-up and drop-off plan in coordination with the Town to ensure the relative trip generation and parking thresholds are maintained by the site. Understanding that the student population will change on a year-to-year basis, it is reasonable that any thresholds are subjected to a reasonable plus/minus tolerance within such a plan.

Site Plan - Transportation

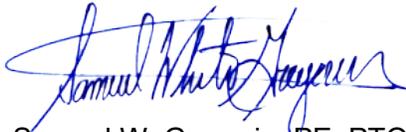
16. The Applicant should confirm on the Site Plans the sight distance triangles both directions from the site's exit driveway along Old Bedford Road. The Site Plans should indicate the areas within those sight triangles where vegetation and signage are to be removed or kept low.
17. The Applicant should provide a vehicular circulation plan which shows that a garbage truck (front-loading) can adequately circulate the site and access the dumpster enclosure. Note that the truck should maintain the same directional flow during pick-up as traditional vehicles and avoid all usable parking stalls.
18. The Site Plans do not appear to provide sufficient space for a standard vehicle in the first parking space along the Virginia Road frontage to reverse and exit the site without potential backing out onto Virginia Road while also avoiding the adjacent parking space. TEC asks that the Applicant provide a turning template for a standard passenger vehicle in this stall.
19. The dimensions of the parking spaces and the adjacent parking drive aisles meet Town of Concord Zoning requirements.
20. A stop-sign and stop-line should be proposed at the terminus of the exit driveway along Old Bedford Road. The plan set should include a sign summary table for all on-site signage that depicts the sign legend, sign size, and sign lettering dimensions in compliance with the Manual on Uniform Traffic Control Devices (MUTCD).
21. The site does not meet the minimum requirements for number of total parking stalls per Concord Zoning requirements. Based on the description provided by the Applicant for drop-off and pick-up, it seems that the number of parking spaces provided will be adequate. Although TEC finds that the number of stalls may be adequate, the Applicant should provide a variance request to the Town. In addition, the Applicant should provide the location for

potential additional parking spaces for future use (not constructed) should the childcare population be expanded.

22. The site plans should include a crosswalk detail and a detail for traffic signage which includes signage height.
23. The typical driveway detail notes the maximum cross-slope as 2%. Please revise the detail to note a maximum 1.5% cross-slope with 0.5%± tolerance to ensure all sidewalks are below the Massachusetts Architectural Access Board (AAB) maximum of 2.0%.

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

Sincerely,
TEC, Inc.
"The **Engineering Corporation**"



Samuel W. Gregorio, PE, PTOE, RSP₁
Senior Design Engineer – Transportation Planning & ITS