Stantec

Memo

To:	Mr. Richard Gosselin, Chairman Millbury Planning Board Municipal Office Building 127 Elm Street Millbury, Massachusetts 01527	From:	Evan G. Drew, P.E.* **NH, ME* Stantec 5 Dartmouth Drive Suite 200 Auburn, NH 03032-3984
File:	19 Canal Street Residential Development Traffic Impact Study Peer Review	Date:	May 4, 2021

Stantec Consulting Services, Inc. ("Stantec") has reviewed the *Traffic Impact Study, Canal Street Residential Development, Millbury, MA* dated April 2021, prepared by WSP USA on behalf of Elite Home Builders of Westborough, MA. The applicant is proposing a 59 unit (45 one-bedroom and 14 two-bedroom) residential development located at 19 Canal Street (MA Route 122A), utilizing a single proposed full-access driveway at the existing unsignalized intersection with Church Street. Stantec review the *Traffic Impact Study* by following the Town of Millbury's Zoning Bylaws, dated May 2018, and industry best practices of such an effort.

STUDY AREA

Existing Roadway and Intersection Geometry

Stantec concurs with the observations with respect to the existing roadway and intersection attributes identified in the study, including the vehicles speeds, intersection types, lane widths, and pedestrian facility geometries. The Millbury Bylaws require the traffic impact assessment to identify existing traffic conditions likely to be affected by the proposed development adjacent to or within 1000 feet of the project boundaries. The Traffic Impact Study provided by WSP USA identified five intersections critical to the project, including the proposed site driveway (to remain unsignalized / stop-controlled) and four signalized intersections on Elm Street, Main Street, and Canal Street. Stantec concurs with the identification of these critical intersections for analysis of the proposed development.

Stantec recommends the study include methodology for establishing speeds along the affected roadways outlined in the Existing Roadway and Intersection Geometry and an explanation as to why these were not included. The Millbury Bylaws for Traffic Impact Assessments states the inclusion of average and peak speeds for the study area within the traffic impact assessment.

Intersection Sight Distance

Stantec recommends WSP USA revise Table 2.2 to clarify the Intersection Sight Distance (ISD) analysis:

- Include and justify the vehicle speed used for all ISD calculations.
- It is not clear what the distinction is between "Required Minimum ISD" and "Calculated ISD". Please clarify and modify as necessary.
- The "Required Minimum ISD" of 250 feet listed in the table does not appear to match AASHTO tables for 30 MPH SSD (if that was WSP USA's intent)

Reference: **19 Canal Street Residential Development**

- The "Calculated ISD" of 330.8 feet listed in the table appears to match AASHTO Cases for Left-Turn from Stop, (if that was WSP USA's intent) however this is not identified in the table. ISD required for Crossing and Right-Turn from Stop cases is also not included or identified.
- Although the proposed driveway is not yet built, WSP USA should determine the Intersection Sight Distance at the engineered location that the applicant proposes. The method of determining the ISD should be described in the Study. Methods to determine ISD could include (but not limited to) field measurements or using digital 3D CAD. The description of horizontal curvatures impacting sight distances do not have relatable benchmarks compared to the geometric descriptions supplied in the Study Area descriptions, especially since the signalized intersections are within 375 feet of the proposed driveway.
- WSP USA should include language identifying the impact of point obstructions of utility poles or other roadside obstructions that may or may not impact the ISD for the proposed driveway.

Stantec would recommend that the applicant continue to review the locations of the existing overhead utility poles, proposed signs, and landscaping locations through construction as to not impede on the proposed intersection sight distances at the site driveway as identified within the traffic impact study.

SAFETY ANALYSIS

Historical Crash Data and Crash Rates

Stantec recommends WSP USA include the backing crash rate analysis calculations and backing ADT volume data used for Table 3.3. so that the WSP's crash rate analysis can be verified.

TRAFFIC ANALYSIS

Existing (2021) and Future No-Build (2025) Traffic Volumes

Stantec concurs with the comparison of the traffic volumes counted in February 2021 with historically available traffic counts provided by a MassDOT count station along the abutting corridor. This comparison reflects MassDOT's *Guidance on Traffic Count Data*, dated May 11, 2020 as part of Engineering Directive E-20-005. The study identified that the counted volumes exceeded the historically available traffic volumes, so the counted volumes were utilized without further COVID-19 related adjustment.

Stantec recommends WSP USA revise the annual growth rate calculations. WSP USA identified that the MassDOT provided Growth Factor for U4-7 is 0.02%, however this data should be read as 0.02, or 2% annual growth rate. This revision will impact all scenarios of the future traffic volumes.

Stantec recommends the study include average daily volumes for the impacted roadway, per the Millbury Bylaws for Traffic Impact Assessments.

One piece of information that was not identified in the body of the study was if the counted volumes required further seasonal adjustment (as the counts were performed in February). Stantec's review of the MassDOT seasonal adjustment factors shows that the roadway types like Canal Street (U4-U7) have a 1.00 adjustment factor for February traffic counts, thus not requiring further adjustment and this is reflected within the study.

Trip Generation and Trip Distribution

Reference: 19 Canal Street Residential Development

Stantec concurs with the use of Land Use Code 221 – Multifamily Housing (Mid-Rise) and the resulting trip generation resulting from the proposed 59 dwelling units.

Stantec recommends WSP USA include daily trip generation to Table 4.1, per the Millbury Bylaws.

Stantec recommends WSP USA include a trip distribution table, diagram, or network that provides trip distribution percentages used before applying the trip generation volumes to the network.

Future Build (2025) Traffic Volumes

Based on the revisions recommended for the growth factor, the Future analyses will need to be revised.

Existing, No-Build, and Build Operation Analysis

The existing traffic signal timings for four of the study intersections were not included in the body or the appendix of the traffic impact study, so Stantec could not verify that the signal timings utilized for the Synchro analysis reflects conditions in the field. WSP USA should provide clarification of the source of inputs provided for the Synchro analysis within the study. Some of the Synchro inputs for the operations analysis appear to be default values for the program, including:

- Concurrent pedestrian phases at all signalized intersections utilizing 7 seconds of walk time and 11 seconds of flashing don't walk clearance time.
- Five second minimum green times, three second yellow clearance and two second all-red times at all signalized intersections.

Within the Existing Roadway and Intersection Geometries section, WSP USA identified the South Main Street and Elm Street intersection to be reconstructed with the Armory Village Green Infrastructure Project Phase 1. When reviewing the operations analysis, this intersection has not been modified to reflect these future geometries to be completed by the ongoing project. Stantec would recommend revising the intersection geometry of South Main Street and Elm Street to its final geometric layout proposed in the Armory Village Green Infrastructure project for the future no-build and build scenarios in the Synchro analysis.

SITE PLAN – TRAFFIC ITEMS

The site plan provided in Appendix A looks to have been updated for the separate Site Plan submission, showing a pedestrian connection between the bay garages along the east side of the property to Canal Street. The most current Site Plan also shows a marked crosswalk and ADA ramps crossing the proposed site driveway along the north side of Canal Street.

However, one of the recommendations within the Traffic Impact Study conclusion identified recommending "a crosswalk be painted at the development site driveway/Church Street intersection connecting sidewalks on both sides of Route 122A (Canal Street)." The study or the applicant should clarify if this was meant to regard the crossing of the new site driveway (northeast corner to northwest corner), or if further design is required for producing a pedestrian facility crossing Canal Street (north side to south side; east side / west side not identified in study). If so, the applicant is recommended to review the existing sidewalk and ramp conditions at the crosswalk at Church Street and improve these facilities to match the suggested Canal Street crossing improvements proposed in the Traffic Impact Study.

Reference: **19 Canal Street Residential Development**

SUMMARY

Overall, Stantec concurs with the findings of the applicant's evaluation of the Town's infrastructure along Canal Street and for the intersections along Canal Street and with Elm Street and South Main Street. The trip generation analysis show that 20 additional vehicles should be expected on the Town's roadway network in the AM peak due to the proposed development, and 27 vehicles and 32 vehicles in the PM and Saturday Peak, respectively. Stantec did find some information missing and some inconsistencies between some of the information provided between sections of this report and when compared with the separately submitted site plan:

- Stantec recommends WSP USA include clarification regarding the speeds of the roadway (average and peak) per the Millbury Bylaws.
- Stantec recommends revising Table 2.2 to include consistent identification of ISD calculations and the expected intersection sight distance of the proposed driveway.
- Stantec recommends including backing calculations for the Crash Rate Analysis.
- Stantec recommends WSP USA correct the annual growth factor error and revise the future no-build and build conditions to reflect this adjustment.
- Stantec recommends that WSP USA include clarifications of the data input used for the traffic analyses of the traffic impact study, so the existing, no-build, and build traffic operations analysis may be verified.
- Stantec recommends that WSP USA revise the geometries used in the traffic analysis for the intersection of South Main Street and Elm Street for the future no-build and future build conditions to reflect the final geometries proposed in the Armory Village Green Infrastructure Project Phase 1, as identified in Section 2.2.5 of the traffic impact study.
- Stantec recommends clarifying the recommendation included in the traffic impact study of including a pedestrian facility crossing Canal Street at the proposed site driveway, which is not reflected on the separately submitted Site Plan by the applicant. Only a revised marked crosswalk of the proposed site driveway was proposed in the applicant's Site Plan.

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