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May 28, 2020

Patrick G. Brennan, P.E.
Amory Engineers, P.C.
25 Depot Street
P. O. Box 1768
Duxbury, MA 02331-1768

Reference: Traffic Study Peer Review
Chapter 40B, Development
314 Plymouth Street, Halifax, MA

Dear Mr. Brennan:

At your request, we have reviewed the "Traffic Impact and Access Study" for the residential 30-unit Development currently planned for 314 Plymouth Street in Halifax. We have also made visits to the site and have reviewed data associated with historical traffic counts. Documents reviewed include:

- Traffic Impact and Access Study by Green International Affiliates, Inc., October 2019
- Site Plans by Silva Engineering Associates, P.C., January, 2020
- Various Mass. Dept. of Transportation (MassDOT) Volume and Jurisdiction Web Sites.

Although the proponent has prepared the impact report generally in compliance with the Institute of Transportation Engineers (ITE), MEPA, and industry standards, there are some questions regarding the methodology and findings in some areas.

Study Area The Study Area chosen by the developer includes Plymouth Street (Route 106 Stop & Shop / Site Driveways, Walmart Driveway, and Monponsett Street (Route 58).) Unless the Board has any question, I feel this is adequate and appropriate since trips beyond this area dissipate quite rapidly and the overall impact will be less the further the study intersections are from the site.

Existing Conditions It appears both MassDOT and Old Colony Planning Council had set Automatic Traffic Recorder (ATR) counts in the area. Table 1 of the report shows results of a count on Rte. 106 west of Homes Street with an average daily traffic count of 10,933 vehicles per day. I noticed a MassDOT count on Rte. 106 just east of South Street with an ADT of 15,703 recorded in 2018. I feel the MassDOT location between Monponsett Street and South Street was more appropriate but I do not see this as problematic. The Turning Movement Counts were conducted in August of 2018 and those peak hour volumes were slightly higher than the ADT's during those commuter periods and were used for design volumes, thus, the daily volumes were not that relevant.

No-Build Condition We do concur with the proponent that there has not been any noticeable normal growth in the area. However, most traffic engineers do adopt a small normal growth of about one-half percent per year to account for small increases. A small normal growth also recognizes an annual increase in licensed drivers, more automobile registrations, and an increase in building permits. Therefore, we agree with the proponent in his adoption of a one-half percent growth per year over the next seven years.

Peak Hour Factors are a measure of how uniform the approaching volumes are throughout the peak hour they are used to slightly inflate the hourly design volume if one fifteen minute period is noticeably higher than the other three fifteen-minute periods to as to smooth out and avoid having the highest fifteen minute period under designed for. Since we did not have the raw turning movement counts, we could not check this variable. However, we did notice the proponent must have used the correct factors since the peak hour factors for commercial driveways were low, as included in the calculations, and a more favorable phf of about 0.95 was not arbitrarily used, thus, there is no need to examine raw turning movement count data.

Site Trip Generation and Distribution I have reviewed the projected trips for the site. Here the proponent shows the number of trips associated with the intended size and use of the property. I have reviewed the number of projected trips shown on the "Summary of Estimated Site Trip Generation" (Table 4) and have confirmed the following for Single Family detached housing:

30 Apartments	Inbound	Outbound	Total
Morning Peak Hour	7	20	26
Evening Peak Hour	20	12	32
Daily	171	171	342

I agree with the proponent in that this Land-Use-Code is probably conservative for this project since the actual trip generation may lean toward a multi-family type development. I have also reviewed the trip directional distribution assignment and have determined their assignment, based on the U.S. Census, does seem reasonable.

Plymouth Street (Route 106) at Monponsett Street (Route 58) Plymouth Street at Monponsett Street will operate at an overall "C" level of service with average delay during both the morning and evening peak hour. However, the northbound Monponsett Street left-turn movement will operate at an acceptable "D" level of service with longer delay. The delay for this particular movement cannot be attributed to any measurable degree due to this project.

Plymouth Street (Route 106) at Walmart Driveway This signalized intersection will continue to enjoy an overall "A" Level of Service during the morning peak hour and a "B" level during the evening peak hour. Based on the directional distribution of the generated trips only one additional vehicle every four minutes will use this intersection in the morning peak hour and approximately one every three minutes in the evening peak hour. This increased volume will hardly be noticeable to Halifax residents in this area.

Plymouth Street (Route 106) at Stop & Shop / Site Driveway Here too, the increased volume will not change the overall "A" level in the morning or "B" level in the evening but there are other concerns regarding this intersection. The capacity calculations at the other two intersections utilized an 80-second traffic control signal cycle length during both peak hours. It is my understanding these three intersections are both actuated and coordinated, yet, the proponent has used a 129-second cycle length here during both peak hours at this intersection. Moreover, as can be seen on sheet 5 of 10 of the site plans, the project site approach to Plymouth Street is slightly off-set from the Stop & Shop exit lane. Since that approach will have almost 50 seconds of delay at a "D" level of service and a queue length or stacking of about 320 feet, some thought should be given to running the northbound and southbound movements separately for both capacity and safety.

Stopping Sight Distance I concur with the proponent that the site driveway will continue to have more than sufficient stopping sight distance along Plymouth Street and is therefore safe.

Preliminary Assessment I have reviewed the material provided and have made field visits. Overall the report was well done and as can be seen above, every intersection will continue to operate at a good level of service. However, the proponent should provide a sketch of the proposed signal and sidewalk improvements. Moreover, the proponent should provide traffic control signal plans including timing and sequence charts and a time-space diagram so the Town can maintain the signal operation in good working order if this roadway is under their jurisdiction as it appears. These construction documents should be approved by the Town prior to construction. Since it is the project development that necessitates this work, the proponent should consider to offer funding for both design and construction.

Sincerely,
GILLON ASSOCIATES

John T. Gillon, P.E.

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