



March 27, 2020

Town of Norfolk – Zoning Board of Appeals
One Liberty Lane
Norfolk, MA 02056

Attn: Chris Wilder - Chairman

Re: Norfolk, MA – The Preserve at Abbyville – Chapter 40B Traffic Review

Dear Mr. Wilder:

BETA Group, Inc. (BETA) has conducted a review of the December 2019 Traffic Impact and Access Study (TIAS) for the proposed Abbyville Development Project in Norfolk, Massachusetts. BETA most recently reviewed documentation for the proposed development project in 2017. This updated TIAS reflects significant changes to the previous program, including but not limited to a reduced building program, an updated site plan with relocated site driveway, and a redefined/reduced study area.

BASIS OF REVIEW

The review was based on the following materials:

- Traffic Impact and Access Study – Proposed Abbyville Development Project – Project Update, dated December 2019 by Green International Affiliates, Inc. (GIA)
- Technical Appendix – Proposed Abbyville Development Project – Project Update, dated December 2019 by GIA
- “The Preserve at Abbyville,” Norfolk, Massachusetts Grading and Utility Plans (3 Sheets), dated March 15, 2017 and revised on December 2, 2019 by United Consultants, Inc.

INTRODUCTION

The proposed 40B project is located on the north side of Lawrence Street adjacent to the town line separating the towns of Franklin and Norfolk. The single site driveway intersects Lawrence Street opposite Bretts Farm Road. The proposed building plan provides 64 residential units, including 20 single family homes and 22 duplex style buildings accommodating a total of 44 condominiums. The existing site is wooded with various dirt trails. The site is approximately 3 miles from I-495 in Franklin.

This proposed project plan has been significantly reduced in size since the last review which included a total of 148 single family homes and 48 apartment units.

FINDINGS, COMMENTS, AND RECOMMENDATIONS

STUDY AREA

The traffic impacts of the proposed development were evaluated at one intersection in Franklin and two intersections in Norfolk:

- Chestnut Street at Mill Street – Franklin, MA
- Lawrence Street at Site Drive/Bretts Farm Road – Norfolk, MA
- Park Street at Lawrence Street – Norfolk, MA

This a reduced study area from previous study which evaluated conditions at two other intersections on Park Street and Main Street. The intersection in Franklin was not included in the previous study.

Lawrence Street is a residential local roadway under Town of Norfolk jurisdiction. The roadway is posted with 30 mile per hour speed limit signs in both directions. Sidewalks are not provided in the area of the Site, though a reconstructed bridge with pedestrian accommodation is provided approximately 2,000 feet east of the site terminating at Cranberry Meadow Road. A sidewalk is provided along the east side of Bretts Farm Road.

TRAFFIC VOLUMES

The TIS references Automatic Traffic Recorder (ATR) data collected on Lawrence Street in 2015. *The data provided in the Appendix was collected on Saturday, September 9, 2017 for Lawrence Street west of Park Street and on Park Street south of Main Street from Saturday, September 9th to Monday, September 11th, 2017. This appended data was not summarized in the TIS.* The summary table presented in this TIS is consistent with data presented in the original April 2017 Traffic Impact and Analysis Report for the larger scale development. This includes ATR data collected on Wednesday, September 9 and Thursday, September 10, 2015 for Lawrence Street east of Eagle Drive.

New Turning Movement Counts (TMC) were collected for Lawrence Street at Bretts Farm Road on Thursday, December 5, 2019. Historical data was utilized for the intersections of the other two intersections. A summary of data collection dates and times is provided below:

| Intersection | Date(s) | Time(s) | Peak Hour(s) |
|--|------------------|------------------------------|------------------------------|
| Park Street at Lawrence Street | Thurs 09/10/2015 | 7:00-9:00 AM 4:00-6:00 PM | 7:00-8:00 AM 4:45-5:45 PM |
| Chestnut Street at Mill Street/Marthas Way | Thurs 10/26/2017 | 7:00-9:00 AM 4:00-6:00 PM | 7:00-8:00 AM 5:00-6:00 PM |
| Lawrence Street at Bretts Farm Road | Thurs 12/05/2019 | 7:00-9:00 AM 4:00-6:00 PM | 7:00-8:00 PM 4:00-5:00 PM |

Three MassDOT permanent count stations were evaluated to determine the need for seasonal adjustment: 3321 – I-495 south of Route 85 in Milford; 6125 – I-495 north of Route 140 in Franklin; and 307 – Route 9 in Westborough. The 2017 MassDOT Seasonal Factors worksheet was also evaluated. Based on the two forms of data, volumes in September and October are generally higher than the average month, while volumes in December are approximately 1.3% lower than the average month. To provide a conservative analysis, the volumes collected in September and October were not adjusted downward, while volumes from December were adjusted upward by 1.3%. This methodology is appropriate.

Given the variance in age of the traffic data, TMC volumes were grown at 1% per year to forecast 2020 conditions at all locations. This methodology is appropriate when newer data is not available.

- T1. MassDOT requires traffic data to be less than two years old; however, additional counts are not recommended at this time due to the ongoing health crisis, which has notably impacted traffic volumes in the Commonwealth. Updated counts could be conducted at when traffic volumes and patterns return to typical levels.

CRASH EXPERIENCE

Crash data was obtained and reviewed from the MassDOT Crash Portal occurring between 2014 and 2018 for all three study area intersections. Crash rates were calculated based on the number of reported crashes and the total entering peak hour volume. The analysis found five reported crashes at Chestnut Street and Mill Street in Franklin. Crashes were primarily property damage, non-injury, sideswipes and single vehicle crashes. One crash was found, occurring in 2014, at the intersection of Park Street and Lawrence Street. The single vehicle crash had no reported severity. Zero crashes were reported over the five-year span in the area of Bretts Farm Road. The calculated crash rates for all three study area intersections are lower than the MassDOT statewide and District 5 average crash rate for unsignalized intersections, 0.57 crashes per million entering vehicles (MEV). The provided crash discussion is acceptable.

PUBLIC TRANSPORTATION

While both the Town of Franklin and Town of Norfolk have MBTA Commuter Rail service to Boston via the Franklin line, the two stations are farther than typical walking distance (0.5 miles). It is expected that projected traffic from the Site would drive to these stations. Trip distributions for the proposed Site were based on local traffic patterns (based on existing volumes). It was assumed that these patterns include traffic to/from the commuter rail stations. This discussion and methodology are acceptable.

NO-BUILD TRAFFIC VOLUMES

A seven-year design window was used to evaluate future conditions in the study area. The 2027 No-Build conditions were estimated by applying a 1% per year growth rate, consistent with previous methodology, at seven years to the existing 2020 adjusted traffic volumes. In addition, the volumes reflect background traffic generated by nearby developments. The TIAS noted that traffic volumes from two developments in Franklin and Wrentham were incorporated. However, the TIAS only discusses volumes related to the Park Place development in Wrentham. Backup data for these two developments was not provided in the Appendix.

- T2. Provide a discussion for the development in Franklin.
T3. Provide backup information in the Appendix for the nearby development trips.

BUILD TRAFFIC VOLUMES

SITE DEVELOPMENT TRIPS

Project trips were estimated based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. The proposed site is expected to provide 64 units of housing, including 20 single family homes and 22 duplexes (44 units). Despite the difference in land use, trips were generated based on Land Use Code 210 – Single Family Detached Housing, which assumes all 64 units are single family homes. This was noted to be conservative, as single family homes generate more trips than smaller residential units. BETA finds this methodology to be conservative and acceptable.

The trip generation estimation found the site is expected to generate 690 trips per day with 51 (13 enter, 38 exit) in the morning peak hour and 66 (42 enter, 24 exit) in the evening peak hour. BETA finds these calculations to be in accordance with industry standards.

TRIP DISTRIBUTION

Trip distribution was based on exiting travel patterns as obtained by turning movement counts and Journey to Work data from the US Census Bureau. This exercise utilized four primary routes to Park Street (north and south) and Chestnut Street (north and south). No trips were distributed to Bretts Farm Road or Martha's Way given their lack of connectivity. Based on the data, approximately 45% of trips were distributed to/from Chestnut Street (20% North, 25% South) and 55% of trips were distributed to/from Park Street (30% North, 25% South). BETA finds this methodology to be reasonable.

TRIP ASSIGNMENT

Trips were assigned to the network based on the trip distribution percentages discussed above. Build volumes were obtained by adding the assigned trips to the 2027 No-Build traffic volumes BETA finds this methodology to be appropriate.

ANALYSIS

Capacity analysis was performed for the three unsignalized study intersections with Synchro 10 software based on the methodology presented in the *Highway Capacity Manual, 6th Edition*. The Level of Service (LOS) results found acceptable operations (LOS C or better) for most movements in the study area. The westbound STOP controlled approach of Mill Street at Chestnut Street was found to degrade from LOS C to LOS D in the evening peak hour as a result of added project trips. This is related to an increase of approximately 3 seconds per vehicle. Queues were found to be small, one to two vehicles, in both peak hours. Some discrepancies were found when reviewing the analysis output sheets provided in the Appendix. It is noted that these discrepancies are not expected to dramatically change the conclusions of the study.

- T4. There appears to be a typo on page 19 which refers to "Chestnut Hill Street."
- T5. Analysis sheets provided in the Appendix were found to have mismatched parameters between AM and PM peak hours. Revise accordingly.
- T6. Analysis sheets provided in the Appendix were not found to match results presented in Table 5 and Table 6 of the TIAS. Clarify and revise accordingly.

SIGHT DISTANCE

Sight distance was evaluated based on the posted speed of 30 miles per hour and measured 85th percentile speed of 36 miles per hour, obtained as part of the 2015 data collection. According to the American Association of State Highway and Transportation Officials (AASHTO), the required Stopping Sight Distance (SSD) for 35 miles per hour is approximately 250 feet assuming relatively level grade. The measured SSD for vehicles traveling on Mill Street and Lawrence Street was noted to be approximately 420 feet from the west and 515 feet from the east. Vehicles approaching from the west travel along a vertical and horizontal curve approximately 420 feet west of the proposed Site Drive. A similar curve is located approximately 500 feet east of the proposed Site Drive. Based on the measured speed in 2015, the available SSD is adequate for this type of roadway. Intersection Sight Distance (ISD) was also evaluated based on a travel speed of 35 miles per hour. According to AASHTO, the available ISD must be equal to or greater than the required SSD to ensure safe operations. In addition, AASHTO provides desirable distance (± 390 feet) to

ensure that a vehicle traveling along the main street is not required to reduce their speed below a specified percentage. The measured ISD for the driveway was found to be approximately 400 feet in each direction provided the site driveway is constructed to limit vegetation and provide clear sight triangles.

T7. See Comment T1 relating to the age of data. Similarly, collecting new data is not recommended at this time due to the unstable/unusual conditions.

RECOMMENDATIONS

The TIAS provided six recommendations including:

- a. Ensure that proposed landscaping is low and set back so as not to obstruct sight distance.
- b. Regularly clear roadside vegetation within the right-of-way to improve sight distance.
- c. Provide a STOP sign and stop line for the Site Driveway.
- d. Install a STOP sign and stop line for Bretts Farm Road.
- e. Install THICKLY SETTLED signs with supplemental 30 mph plaque for Lawrence Street near the Franklin town line and near Cranberry Meadow Road
- f. Ensure that all installed signs are conformant to the MUTCD.

BETA generally supports these recommendations but offers the following comments:

- T8. Verify that a legal speed regulation exists for the posted 30 mph speed limit signs. If no such regulation exists, signs should be removed in accordance with MGL 90.18
- T9. Verify that Lawrence Street meets the criteria for “Thickly Settled” as defined in MGL 90.17.
- T10. Consider installing “Intersection Ahead” (W2-1) signs in advance of the proposed Bretts Farm Road and Site Driveway intersection to alert drivers of the new four legged intersection configuration.

If we can be of any further assistance regarding this matter, please contact us at our office.

Very truly yours,
BETA Group, Inc.



Tyler de Ruiter, PE, PTOE
Project Engineer

cc: Amy Brady – Norfolk Zoning Clerk
Tom DiPlacido

Job No: 4980