



ENGINEERING SUCCESS **TOGETHER**

November 02, 2016

Michael Kulesza, Chairman  
Town of Norfolk – ZBA  
1 Liberty Lane  
Norfolk, MA 02056

Re: Norfolk, MA – Lakeland Farms Townhouse Community  
Traffic Peer Review

Dear Mr. Kulesza:

As requested by the Board, BETA Group, Inc. (BETA) has revisited the Traffic Impact Analysis (TIA) and technical peer review for the project. The TIA was prepared by WSP/Parsons Brinkerhoff dated June 2, 2016. BETA provided an initial technical review letter dated July 12, 2016. Responses were provided by WSP/Parsons Brinkerhoff dated August 12, 2016. BETA issued a follow-up review letter dated August 29, 2016 indicating that in general the responses were acceptable and that no further review was anticipated.

Subsequently, the Board requested that BETA revisit the TIA particularly in regard to the estimated trip generation volumes from the development and sight distance concerns. We have reviewed the information previously provided in regard to these items as well as our previous review. As noted in our follow-up review letter, we feel that the TIA was prepared in accordance with industry standards and adequately represents the anticipated traffic impacts from the proposed development.

The following provides a review of the parameters that are considered as part of the technical peer review. Please note that in our review we need to adhere to accepted industry standards in order to provide justification for any comments.

The generally accepted industry publications/standards are:

- ITE Trip Generation Manual, 9<sup>th</sup> Edition, Institute of Transportation Engineers
- Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials (AASHTO)
- Highway Capacity Manual, Transportation Research Board

The basis of BETA's review is to ensure that the Traffic Impact Analysis (TIA) prepared by the Applicant is prepared in accordance with accepted industry practice and accurately reflects the anticipated impacts from the proposed development. The TIA must be prepared in accordance with these standards to provide a consistent level of comparison for projects. The analysis parameters cannot be arbitrarily applied from one project to the next.

1. The number of vehicle trips expected to be generated by the development must be estimated. The ITE Trip Generation Manual is the accepted industry standard for estimating trip generation based on particular land uses. The manual provides estimated vehicle trip rates for peak hours and

average daily traffic for a variety of land uses based on numerous studies of different types of uses. The TIA submitted for the project properly applied the vehicle trip generation rates provided in the ITE Trip Generation Manual. The estimated trip generation based on 40 units was:

- AM peak - 25 vehicle trips
- PM peak – 28 vehicle trips
- Average Day – 230 vehicle trips

The traffic counts conducted for the project and included in the TIA showed the following existing volumes in the vicinity of the site:

- AM peak - 280 vehicle trips
- PM peak – 240 vehicle trips
- Average Day – 2,560 vehicle trips

2. Level of Service is a measure of the operating characteristics and delay experienced by vehicles at intersections. Level of service is calculated using methodology provided in the Highway Capacity Manual and is reported from LOS A to LOS F. LOS A indicates little or no delay while LOS F indicates operations approaching capacity. The TIA properly applied the methodology for calculating LOS. The TIA found that the site driveway is expected to operate at LOS B or better and there was no anticipated reduction in LOS at Fruit Street as a result of the project generated traffic.
3. The safety of the existing roadway is considered as part of the review of potential traffic impacts. If crash data indicates that the existing roadway experiences a significantly higher number of crashes than expected for a similar type road, it may indicate a safety issue that may be negatively impacted by additional traffic. BETA requested that the Applicant provide crash data for Cleveland Street in the vicinity of the site and the adjacent intersections. The data provided indicated that the crash rates on Cleveland Street and at the intersections were consistent with or lower than expected crash rates for similar local rural roadways. Therefore, there is no indication that the additional traffic generated by the development would negatively alter the crash history.
4. Stopping Sight Distance is key element of the design of the intersection of the site driveway at Cleveland Street. The AASHTO publication “Geometric Design of Highways and Streets” provides values for minimum stopping sight distance based on vehicle speeds. The measured 85<sup>th</sup> percentile speed on Cleveland Street as reported in the TIA is 41 MPH both eastbound and westbound. This requires a stopping sight distance of 316 feet. The TIA reported available stopping sight distance at the driveway entrance in excess of this requirement. This was verified by BETA as part of our review. BETA requested that the Applicant provide available stopping sight distance measurements at several other intersections to determine if this was related to any identified safety concerns. It was noted that sight distance was restricted at some locations by existing vegetation. However, as previously noted, there is no indication of identified safety concerns.

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5. It is suggested that a sight triangle providing the minimum stopping sight distance be shown on the plans to ensure that this sight triangle is contained within the Applicant's property or the public right of way to allow for provision of clear sight lines.
6. BETA reviewed the photographs provided showing vehicles parked along Cleveland Street. Clearly these vehicles block part of the travel lane and may restrict sight distance. However, this does not appear to be a "usual" or consistent event and therefore it is difficult to consider it in evaluating the overall traffic impact from the development.

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

Very truly yours,  
BETA Group, Inc.



William P. McGrath, P.E.  
Associate

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