



November 6, 2014

Mr. Hans Larsen, Executive Director  
Town of Wellesley  
525 Washington Street  
Wellesley, MA 02482

Attn: Meghan Jop, Deputy Director

**RE: 22 Pleasant Street Traffic Peer Review**

Dear Mr. Larsen:

As requested, BETA Group, Inc. has reviewed the documents regarding the proposed construction of six condominium units at 22 Pleasant Street. The documents provided to BETA for this review included:

- *Traffic Impact Assessment (TIA)* dated September 9, 2014 by The Engineering Corp. (TEC Inc.)
- *Response to Comments from Michael Zehner* dated September 18, 2014 by TEC Inc.
- *Residential Development Plans* dated September 5, 2014 by Engineering Design Consultants Inc.

The September 9<sup>th</sup> letter discussed driveway sight distances, generated traffic volumes, and recommended safety improvements. The September 18<sup>th</sup> letter responded to comments from the Town of Wellesley Planning Director, Michael Zehner, issued on September 15, 2014. The response to these comments included discussion of vehicular speeds, volumes, crashes, existing conditions, level of service (LOS), project generated trips, and other operational characteristics regarding this proposed project. The following is a summary of findings and comments regarding these project documents.

## **SITE DISTANCE EVALUATION**

Based on the American Association of State Highway and Transportation Officials (AASHTO) standards, the stopping sight distance (SSD) and intersection sight distance (ISD) were examined at the site driveway in both the September 9<sup>th</sup> letter and the September 18<sup>th</sup> letter. The SSD is the distance at which an oncoming vehicle on Pleasant Street can see a vehicle exiting the site driveway. The ISD is the distance at which a vehicle exiting the site driveway can see oncoming vehicles on Pleasant Street such that they can exit the site without conflict. It was noted that ISD requirements are typically greater than SSD requirements as cars take longer to accelerate when exiting a driveway, though at a minimum ISD should be greater than or equal to the SSD for vehicles to avoid conflicts.

### **BETA GROUP, INC.**

315 Norwood Park South, 2nd Floor, Norwood, MA 02062  
P: 781.255.1982 | F: 781.255.1974 | W: [www.BETA-Inc.com](http://www.BETA-Inc.com)



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The sight distance analysis conducted in the September 9<sup>th</sup> letter examined the required SSD assuming vehicles travel at the 20 mile per hour (mph) posted advisory speed limit. At 20 mph, the required SSD is 115 feet. The use of advisory speed limits for sight distance analysis is not recommended. Typically, sight distance analysis is conducted using the 85<sup>th</sup> percentile speed of the roadway; therefore, in the September 18<sup>th</sup> letter, traffic data was collected and determined that the 85<sup>th</sup> percentile speed of the roadway is 25 mph. At a speed of 25 mph, the required SSD is 155 feet. The field measured SSD is 260 feet north of the driveway and 130 feet south of the driveway. While the SSD north of the driveway is met, we want to note that the sight distance is obstructed by an S-shaped horizontal alignment with shrubbery that lines the west side of Pleasant Street. To the south, the roadway increase in grade (approximately 7 to 9%) for approximately 130 feet at the crest of a hill which limits the available sight distance.

The proponent has committed to trimming vegetation on either side of the proposed driveway to ensure and maximize the available sight distance given the S-shaped horizontal alignment. There is an existing 20mph advisory speed sign located on the east side on Pleasant Street (northbound travel direction), we recommend that an S-Shaped warning sign (similar to the southbound travel direction) be added to the top of this sign.

The resulting field measured ISD (intersection sight distance) was found to be 70 feet north of the driveway and 105 feet south of the driveway. The respective ISD does not meet the minimum 155 feet using standard (AASHTO) methodology. It was noted that if vehicles pull forward, closer to the intersection, sight distance is increased (215 feet to the north and 130 feet to the south) but not entirely satisfied due to vision obstructions discussed above. For safety purposes, we recommend that a Stop sign be installed at the site drive to ensure that vehicles will stop before entering Pleasant Street.

In addition, we recommend that a 20 mph advisory speed sign be mounted below the existing "Blind Drive" sign located on the east side of Pleasant Street travelling northbound direction. The advisory speed sign will encourage vehicles to slow down as they travel up and down the hill towards the site drive.

### CRASH DATA

The TIA reviewed MassDOT and Wellesley Police Department crash data for the most recent four years (2010 – 2014) along Pleasant Street. This review determined one crash had occurred over the four year period nearby 76 Pleasant Street. BETA finds this review acceptable.

### EXISTING TRAFFIC DATA

Existing traffic data was collected via automatic traffic recorder (ATR) on Tuesday, September 16, 2014 for a period of 24 hours. This data revealed Pleasant Street carries approximately 713 vehicles



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per day, with 60 vehicles in the morning peak hour and 90 vehicles in the afternoon peak hour. In both peak hours, traffic flows predominantly in the southbound direction. The morning peak hour was found to be between 8:00AM and 9:00AM, while the afternoon peak hour was between 5:15PM and 6:15PM.

The peak hour factor for both peak hours was found to be 0.87, which means that traffic is relatively consistent throughout the peak hour. A low peak hour factor means that traffic is very high for a short amount of time within the peak hour but then decreases during the rest of the peak hour.

### DESIGN VOLUME

The TIA examined nearby MassDOT count stations to determine regional traffic growth over the past ten years. Based on the count stations, traffic has decreased since 2003. To provide a conservative analysis, the existing traffic volumes were increased by 1.0 percent per year. This methodology is consistent with other traffic studies conducted in Wellesley. It is expected that this development will be fully constructed and functional by 2015. Thus, the TIA examined an increase of 1.0 percent for one year. Given this minimal increase, the existing traffic volumes did not change.

Typically, TIA examines traffic conditions five years after the existing conditions year. Since the site generated traffic is less than ten vehicles during the peak commuting periods, the 2015 build condition is acceptable.

### TRIP GENERATION

The estimated trip generation for six condominium units was calculated in both letters. Trip generation was estimated using Land Use Code (LUC) 210 – Single Family Detached Housing as it provides a more conservative trip generation estimation than the corresponding LUC 230 – Residential Condominium/Townhouse. It was found that using LUC 210, the project will generate approximately five trips in the morning peak hour and six trips in the afternoon peak hour. This represents approximately one vehicle trip per condominium unit in each peak hour. BETA finds this methodology appropriate, but offers the following comment:

The Wellesley Project of Significant Impact (PSI) criteria define an impacted roadway as:

*A roadway segment, including one or more approaches to a signalized intersection... traversed by 20 or more vehicles related to the project in a single direction during any single hour and it...*

Since this project will generate less than 20 trips in either peak hour, no nearby roadways/intersections are considered to be impacted as part of this project.



## **TRAFFIC OPERATIONS**

Using the projected design volume and the proposed trip generation, the TIA analyzed traffic operation conditions at the site driveway in 2015. The traffic analysis determined all approaches will operate at level of service (LOS) A during both the morning peak hour and afternoon peak hour. Vehicles entering and exiting the site driveway will experience a delay of approximately eight seconds in both peak hours. The projected queues for this driveway are minimal. BETA finds this analysis acceptable.

## **PEDESTRIAN AND BICYCLE SAFETY**

The Wellesley PSI criteria states:

*Pedestrian and bicycle circulation shall be provided in accordance with recognized safety standards; provided in all cases sidewalks within a walking distance of 600 feet of the Project shall be provided and in addition sidewalk connections within such radius to surrounding neighborhoods and to public transportation shall be provided as required by the Special Permit Granting Authority in a safe and convenient condition and consistent with standards of the Massachusetts Highway Project Development and Design Guide.*

The TIA notes that sidewalks are provided along both sides of Pleasant Street. Though crosswalks and bike accommodations are not provided on Pleasant Street in the project area, traffic volumes and speeds are considerably light due to the residential nature of this roadway. Crosswalks and bike accommodations are not proposed as part of this project. BETA finds this acceptable given the current roadway conditions but offers the following comment.

- The TIA should discuss whether the sidewalks should be upgraded to meet current design standards and any potential improvements that can be completed to increase pedestrian and bicycle safety and access from the proposed site/neighborhood.

BETA recommends the following improvements:

- A sidewalk connection for pedestrian access from the site to Pleasant Street should be provided.
- ADA ramps should be provided at the site driveway curb cut on Pleasant Street.
- Crosswalk markings, a stop bar, and stop sign should be provided for driveway of the site.

## **SITE PLAN**

The site plan proposes six single unit condominium structures positioned on the existing property. The site will utilize the existing driveway location for an 18 foot wide two-way driveway. A stone



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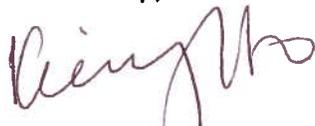
wall is proposed on the southern side of the driveway that meets the existing stone wall along the front of the property on Pleasant Street.

- The plan shows an 18-foot driveway. A driveway width of 20 feet is recommended to ensure two-way traffic flow is safely accommodated, particularly during the winter months when snow embankments narrow roadway widths.
- Consideration should be given such that this stone wall does not inhibit sight distance for vehicles exiting the site driveway.
- Ensure that emergency vehicle maneuvers within the site are adequate. An AutoTURN analysis should be provided.

The proposed site plan provides 19 parking spaces, approximately seven more than required under the Town of Wellesley bylaws. The two spaces per dwelling unit, required under the zoning bylaw, are included as a two car garage for each condominium unit. In addition, seven parking spaces, including one handicap accessible space, are provided within the on-site parking lot. The proposed site plan effectively provides parking for two tenants and one guest per condominium unit. BETA finds the proposed parking to be adequate.

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

Very truly yours,  
BETA Group, Inc.



Kien Ho, P.E., PTOE  
Vice President

CC: Tyler de Ruiter, EIT

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