AKRF

Environmental and Planning Consultants

34 South Broadway
Suite 401
White Plains, NY 10601
tel: 914 949-7336
fax: 914 949-7559
www.akrf.com

Memorandum

To: Town of Dover Planning Board

From: Ashley Ley, AICP and Anthony Russo

Date: December 3, 2012

Re: Westchester Modular Traffic

In preparing Part 3 of the Environmental Assessment Form (EAF) on behalf of the Planning Board, AKRF estimated the Proposed Project would generate 7 AM peak hour vehicle trips, and 8 PM peak hour trips on a weekday. We understand that members of the public have raised concerns as to the validity of these estimates. It is important to note that these projections are estimates of the amount of traffic that would be generated by the Proposed Project, and that they are independent of existing or future background conditions.

The Proposed Project would generate a de minimis amount of traffic – a maximum of 8 peak hour trips based on the Institute of Transportation Engineers (ITE) Trip Generation Manual 9th Edition. The ITE manual is the traffic engineering industry standard for determining traffic generation from various land uses, including this multi-family residential.

In response to comments from the Planning Board and the public, the applicant has offered to construct four town-house style buildings (each with four two-story apartments) instead of the previously proposed single-level apartment design. Since the bedroom count for this revised layout would remain the same as what was analyzed in the EAF, this design change would not affect the anticipated traffic generation of the Proposed Project.

Traffic conditions were observed to be acceptable in the area of the Proposed Project along Reagan's Mill Road. Based on the 2010 Highway Capacity Manual (HCM) standards conditions were observed to be Level-of-Service (LOS) A to B (see below for LOS description). LOS A and B indicate free flowing traffic conditions with minimal to no delays. Therefore, given the low traffic generation of the Proposed Project and the acceptable baseline conditions on the roads near the Project Site there would be no significant traffic impacts. The proposed project would not cause any noticeable changes in volumes or delay in the area.

There are no national or industry wide standards that define what constitutes a significant traffic impact. However the New York City Environmental Quality Review (CEQR) Manual states that the evaluation for potential traffic impacts with a proposed action in-place begins at mid-LOS D. This is clearly not the case in the area of the Proposed Project.

2010 HIGHWAY CAPACITY MANUAL (HCM2010) CAPACITY ANALYSIS METHODOLOGY

Signalized Intersections

The HCM2010 methodolgy evaluates signalized intersections for average control delay per vehicle and level of service (LOS). LOS can be characterized for the entire intersection, each intersection approach, and each lane group. Control delay alone is used to characterize LOS for the entire intersection or an approach. Control delay and volume-to-capacity (v/c) ratio are used to characterize LOS for a lane group. Delay quantifies the increase in travel time due to traffic signal control. It is also a surrogate measure of driver discomfort and fuel consumption. The volume-to-capacity ratio quantifies the degree to which a phase's capacity is utilized by a lane group.

LOS A describes operation with a control delay of 10 seconds per vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B describes operation with control delay between 10 and 20 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C describes operation with control delay between 20 and 35 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D describes operation with control delay between 35 and 55 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E describes operation with control delay between 55 and 80 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F describes operation with control delay exceeding 80 seconds per vehicle or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

A lane group can incur a delay less than 80 seconds per vehicle when the volume-to-capacity ratio exceeds 1.0. This condition typically occurs when the cycle length is short, the signal progression is favorable, or both. As a result, both the delay and volume-to-capacity ratio are considered when lane group LOS is established. A ratio of 1.0 or more indicates that cycle capacity is fully utilized and represents failure from a capacity perspective (just as delay in excess of 80 seconds per vehicle represents failure from a delay perspective).

The control delay criteria for the range of service levels for signalized intersections are shown in **Table 1.**

Table 1
LOS Criteria for Signalized Intersections

Control Delay Per Vehicle	Level-of-Service (LOS)[(1)]	
	v/c ratio ≤ 1.0	v/c ratio > 1.0
≤ 10.0 seconds	A	F
>10.0 and ≤ 20.0 seconds	B	F
>20.0 and ≤ 35.0 seconds	C	F
>35.0 and ≤ 55.0 seconds	D	F
>55.0 and ≤ 80.0 seconds	E	F
>80.0 seconds	F	F

Source: Transportation Research Board. *2010 Highway Capacity Manual*.
Note: (1) For approach-based and intersectionwide assessments, LOS is defined solely by control delay.

Unsignalized Intersections

LOS for a two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections is determined by the computed or measured control delay. For motor vehicles, LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns at TWSC intersections and for all movements at AWSC intersections. LOS is not defined for the intersection as a whole for TWSC and AWSC intersections.

The LOS criteria for both TWSC and AWSC unsignalized intersections are summarized in **Table 2**.

Table 2
LOS Criteria for Unsignalized Intersections

Control Delay Per Vehicle	Level-of-Service (LOS)[(1)]	
	v/c ratio ≤ 1.0	v/c ratio > 1.0
≤ 10.0 seconds	A	F
>10.0 and ≤ 15.0 seconds	B	F
>15.0 and ≤ 25.0 seconds	C	F
>25.0 and ≤ 35.0 seconds	D	F
>35.0 and ≤ 50.0 seconds	E	F
>50.0 seconds	F	F

Source: Transportation Research Board. *2010 Highway Capacity Manual*.
Note: (1) For TWSC intersections, the LOS criteria apply to each lane on a given approach and to each approach on the minor street (for TWSC intersections). LOS is not calculated for major-street approaches or for the intersection as a whole.

Note that the LOS criteria for unsignalized intersections are somewhat different from the criteria used in signalized intersections. At TWSC intersections, drivers on the stop-controlled approaches are required to select gaps in the major-street flow in order to execute crossing or turning maneuvers. In the presence of a queue, each driver on the controlled approach must also use some time to move into the front-of-queue position and prepare to evaluate gaps in the major-street flow. AWSC intersections require drivers on all approaches to stop before proceeding into the intersection.