Technical Memorandum

Date: July 17, 2007

To: Town of Plymouth Planning Board

Cc: Town of Bourne Planning Board
Town of Carver Planning Board
Town of Wareham Planning Board

From: James D. Fitzgerald, P.E.
Andrew J. Arseneault

Subject: Proposed Wareham Road
Mixed Use Development
Plymouth, MA
Traffic Peer Review Summary

Jacobs Edwards and Kelcey (JEK) was retained by the Town of Plymouth Planning Board to conduct a Traffic Peer Review for the proposed construction of the Wareham Road Mixed Use Development. The Proponent of the project had retained Vanasse Hangen Brustlin, Inc. (VHB) to prepare a Draft Environmental Impact Report (DEIR) dated February 15, 2007 evaluating the expected traffic impacts of the project. JEK finds the report primarily in conformance with standard engineering practice with the following exceptions. This memorandum summarizes the review of this DEIR and provides suggestions for the Town to consider prior to issuing project acceptance.

Study Area

It appears that the study area selected for this project is complete; no additional intersections are necessary to assess the impacts associated with this project.

Seasonal Adjustments

The seasonal adjustments performed within this study area appear to be appropriate.

Future Traffic Volumes

It appears that some projects, including but not limited to; the Wareham and Carver portions of the AD Makepeace Development, the Wareham Shopping Center located off Route 28 in Wareham, the proposed commercial developments located off the Bourne Rotary, and the industrial parks proposed south of the project site in Plymouth and Bourne have not been included in establishing future traffic volumes. These projects may increase traffic volumes within the study area. The Proponent is urged to work with the Towns of Bourne, Carver and Wareham to ensure that any projects which may impact traffic volumes are included in future scenarios.

Trip Generation and Distribution

The Proponent is asked to reinvestigate the appropriateness of the assumed 15% and 60% internal capture rate used for the residential and retail portions, respectively, of the development. Although these values were suggested in the scoping letter dated April 12, 2006; it appears that a more conservative internal capture rate would be desirable for the traffic generated by this development.

It appears that the site-generated traffic using Long Pond Road to travel north may be overstated. As the model currently stands, motorists will travel along Long Pond Road past the Route 3 Interchange #3 to travel to destinations located to the north. It would seem that most of these trips would be better served by traveling on Route 3. A brief review found that an additional 2% can be shifted from Long Pond Road to Interchange #3 in order to access Route 3 sooner. It should be noted that this alteration may have a negligible effect on the project's overall impacts.

Vehicles are not shown making left turns into or right turns out of two of the site roadways intersecting Bourne Road. Clarification of any turn restrictions is requested.

It appears that the residential component favors the use of Route 3 to travel to destinations located northwest of the project site. The Proponent should consider weighing the effects of drivers instead using Route 25 to I-495 to travel towards these destinations.

Capacity Analysis

The peak hour factor used for the eastbound approach at the intersection of Long Pond Road at Clark Road is 0.92 in all instances. This should be revised based on the existing manual turning movement counts.

Presently, slip ramps are provided for all right turning vehicles entering Route 3 from both Clark Road and Herring Pond Road; however they are not modeled this way on the analysis printouts. The Proponent should explain the reasoning for not including the slip-ramps in the analysis.

Mitigation Measures

It is expected that the proponent will work to ensure that proposed mitigation measures expected to be completed by others are in place prior to the occupancy of this development. The proponent needs to commit to the improvements with the study area as shown under 2016 Build conditions whether funding from other sources does or does not exist.

In general, it is recommended that mitigation measures be presented for any intersection with either overall or critical movements operating at a Level-of-Service (LOS) F for signalized or unsignalized intersections, respectively. This recommendation should be extended to serve any intersections suffering a degradation of two LOS grades or more or having a crash rate higher than statewide or district averages. In addition, all mitigation proposed for the project should include a specific timeline for implementation.

The proposed project significantly degrades the LOS at the intersections of Halfway Pond Road at Bourne Road and Halfway Pond Road at Justine Road. The Proponent should investigate several measures for roadway improvements at this location ideally by providing and implementing geometric improvements or, if all options to improve the roadway are shown to be ineffective, conducting a detailed traffic signal warrant analysis (TSWA) and providing traffic signal control to reduce the impacts at these locations.

The intersections of Long Pond Road at Halfway Pond Road and Bloody Pond Road, Halfway Pond Road at Wareham Road and Mast Road, and Plymouth Lane at Head of the Bay Road have a history of motor vehicle crash rates greater than statewide and district averages. While the Proponent proposes to improve the existing signs and pavement markings at these locations, the Proponent should investigate if geometric improvements, additional clearing of visual obstructions or active warning devices would more adequately improve safety operations. The same improvements should also be investigated at the intersections of Long Pond Road at Herring Pond Road and Tamarack Road if a traffic signal installation is not warranted under design year conditions.

Plymouth Traffic Concerns

The Town of Plymouth comments *'The installation of <u>traffic calming devices</u> both within the development and on existing ways servicing the development, and to recommend appropriate*

alternatives suited to the rural character of these roads. Generally, this will be the preferred alternative to widening/straightening of existing connector roads due to the likelihood that widening/straightening would lead to increased speeds.' JEK agrees with the concept of traffic calming devices. This comment will be addressed in detail when the conceptual improvement plans are made available for review.

The Town of Plymouth comments *'The Town requests that the Proponent also work with the Town to explore possible locations of additional east/west road connections, including possible road connections on Town land or land owned by others, such as Little Sandy Pond Road. Other ways to move traffic north-south by creating east-west connectors to alleviate putting all traffic onto Bourne Road? The town respectfully requests multiple models of the traffic projections based on the anticipated bedroom mixes of the Project.'* JEK agrees that the Proponent should work with the Town to identify potential corridors for a roadway located to the east of the project site to divert project related traffic away from Bourne Road. The Proponent should reflect the altered trip distribution based on these proposed roadways.

The Town of Plymouth comments *'The commercial uses anticipated in a TRVD at this location would serve to benefit existing communities in this remote area of Plymouth and Wareham, and may impact existing local traffic patterns. Does this study adequately account for the likelihood of Bourne/Wareham Roads becoming pass-through routes to the village center at the Project? Without knowing what the uses are of the proposed community center referred to in the DEIR, can we assume these project trip patterns are adequate, or are they not adequately addressed by the numbers provided?'* The assumed Institute of Transportation Engineers (ITE) Land Use Code (LUC) used for the commercial component appears to be sufficient to determine the impacts associated with the proposed development. The LUC used was 820 General Commercial, which surveyed various 'neighborhood centers, *community centers*, regional centers, and super regional centers'. It appears that the Proponent has conservatively estimated traffic volumes along Bourne Road and Wareham Road accounting for origins and destinations outside of the project area, however, this assumption needs to be confirmed after reviewing the 60% trip reduction taken as an internal capture.

The Town of Plymouth comments *'A Gravel Road Committee has been created in the town to study the needs of roadway improvements on the gravel roads, and to facilitate a recently-adopted Town Gravel Road Bylaw and comprehensive plan for these roadways. The Proponent shall consult with the committee as part of their overall plan to make roadway improvements on*

Wareham Road, and any other connecting gravel roads network.' Again, the Proponent should continue to work with the Town and its subcommittees to assure that input is received and the livability of the surrounding community is, at a minimum, upheld at the completion of this development.

The Town of Plymouth comments '*Wareham Road provides access to large trucks moving cranberries and gravel from the subject property to other destinations, and is also used by school buses and existing residents. The Proponent states in the DEIR that Wareham Road, as well as others, is part of the proposed truck route for construction vehicles associated with the Project. We prefer that they pave Wareham Road to binder with drainage improvements and including moving the road away from the dangerous bog curve in southerly portion of Wareham Road prior to the start of construction of the Project, subject to Gravel Committee review.'* JEK agrees with this statement. Roadways which are proposed to be paved should be paved prior to the development's construction. Use of gravel roadways by construction vehicles should be minimized.

The Town of Plymouth comments *'The Proponent has agreed to provide road rights-of-way wherever the Proponent owns land where a layout does not exist and can be created, including drainage easements. The Town is concerned about the road improvements that might be proposed on roads that have a "used and maintained" (i.e. no road right-of-way exists) status or existing conservation restrictions that are not owned by the Proponent, as eminent domain takings of other legal matters may have to be considered in order to implement certain aspects of proposed improvements. The Proponent has offered mitigation which it believes can be completed within existing road layouts, and has offered to provide more detailed information to confirm these issues do not exist.'* JEK agrees that the Proponent should provide more detailed information to ensure these issues do not exist.

The Town of Plymouth comments *'The Proponent has agreed to provide more specific information regarding the anticipated life span and capacity of modern roundabouts as compared to other potential mitigation measures, and has offered to facilitate workshops on the proposed "modern roundabouts" to help the community better understand how this can be accomplished. Residents are concerned that roundabouts provide reasonable traffic gaps so they can pull out onto affected roadways from the existing side roads.'* JEK agrees that the Proponent should continue to work with the Town's residents to educate them through a series of

public presentations about roundabout operation. The Proponent has committed to present the traffic model (simulation) for the next traffic workshop of the project.

The Town of Plymouth comments *'The Proponent has agreed to work with the Town to further address the proposed* <u>*mitigation package*</u> *so that we can better understand how the proposed improvements can adequately address the >130% peak usage of many of these intersections with respect to LOS. The Town has asked the Proponent to consider in our negotiations an approach to a larger fully-addressed mitigation package rather than several smaller proposed improvements designed to 25%. The Proponent has agreed to provide projected costs of the various proposed mitigation broken down to on and off-site.'* It appears that additional mitigation should be required to maintain or improve livability within the study area as discussed above. The Proponent should work with the Town and its subcommittees to establish a sufficient mitigation package.

The Town of Plymouth has also provided the following comments:

- *Did the traffic study include the school facility plan done by the Town in 2006 which projected possible expansion to the South Plymouth High School campus on Long Pond Road?* The Proponent has referenced the school expansion project but should clarify the approach taken to produce the anticipated traffic volumes generated by this project.

- *Is the traffic impact analysis addressing the impacts in Wareham, including Glen Charlie/Plymouth Avenue/Baker Road intersection?* The intersection of Glen Charlie Road at Plymouth Avenue and Baker Road was analyzed in the report. The projected impacts to this intersection are insignificant compared to 2016 No-Build conditions. Additional mitigation measures would be better served at other intersections.

- *Improvements to Long Pond Road and Ship Pond Road intersection geometry are needed; Town will provide information on this intersection, DPW has been working on proposed improvements and has done detailed survey.* It appears that the sight distance is obscured by a large vertical curb and areas of heavy vegetation as well as significant geometric concerns at the intersection of Long Pond Road and Ship Pond Road. The Proponent should provide improvements to this intersection as part of the project mitigation.

- *Clark Road and Route 3 at Long Pond Road intersection need improvements, Wildlands Trust and Pinehills CRs may be an issue.* The intersection of Clark Road at Long Pond Road appears to have substandard sight distances. The Proponent should provide improvements to these intersections with minimal impacts to neighboring abutters.

- *Table 9-9 clearly shows at least a 30% increase in use during peak periods yet the summaries say impacts don't exceed 10%. Are internal trips included in Table 9-9 analysis, should they be?* The impacts referenced in Table 9-9 are a comparison of 2016 No-Build volumes to 2016 Build volumes with differences not exceeding 10%. The 30% increase in question is a comparison of 2006 Existing volumes to 2016 Build volumes which includes traffic impacts due to unrelated projects and general background growth.

- *Halfway Pond Road and Long Pond Road intersection – perhaps monitor to evaluate if improvements are needed. Is this adequate, has a roundabout been considered? This intersection is excluded from Table 9-9, what about this intersection? Does this intersection have geometry issues.* This intersection has been analyzed in the report. Although the proposed development is not expected to significantly impact traffic operations at this intersection, geometric improvements, such as a modern roundabout, should be investigated at this intersection. Table 9-9 is provided to show the volume increases outside of the study area. The impacts to this intersection are investigated within the Traffic Operations Analysis section and therefore were not included in Table 9-9.

- *Consider geometry at Halfway Pond Rd/Bourne Road intersection – is it acceptable for a modern roundabout?* As mentioned above, the Proponent should investigate geometric improvements at this location due to the significant increase in delay time anticipated after the occupation of this development.

- *Truck routes and permanent postings regarding same, including agricultural uses are desired.* Permanent truck routes should be provided to deter heavy vehicles from using residential roadways.

- *The Construction section of the DEIR includes a truck route of Long Pond to Halfway to Bourne Road – is this appropriate? Would it be better to construct the "connector" road? Does the traffic analysis and mitigation package take this 10-15 year build out and all of this truck traffic into account? Do the proposed safety mitigation up-front measures deal with truck turning radius and intersection impacts over the 10-15 year span? This is not clear from looking at the study.* Clarification is required by the Proponent regarding truck routes. The completion of the connector road to provide a route for construction vehicles should be investigated.

- *Are the proposed collector streets and potential school bus routes designed to accommodate school busses, without forcing the bus to turn around?* Additional detail should be provided regarding the proposed roadways and anticipated bus accommodations. Once the plans are made available, adequacy for truck turns will be reviewed.

- *The Town has requested corridor study to assist the Town with Long Pond Road/Bourne Road (from existing public layout to transmission lines south of the proposed connector road)/Halfway Pond Road – vertical/horizontal alignments.* It appears that the vertical alignment of the roadways within this corridor create sight distance problems at many of the intersections. The Proponent should work with the Town to determine if improvements can be made along these roadways.

- *Consider a roundabout at Bourne Road and new Connector Road.* It does not appear that a modern roundabout will be necessary to achieve an acceptable Level-of-Service under Build conditions at this location. The need for a roundabout as a traffic calming measure will be reviewed further when conceptual improvement plans are made available for review as discussed above.

- *Ramps vs. Lights at Exit 2 – lower priority for mitigation since included in regional Traffic Improvement Plan (TIP) and other funding mechanisms may address?* The Proponent should work with the Town to determine if this location should be included in the mitigation package.

- *Exit off of 25 is included in the regional Traffic Improvement Plan (TIP) – would the Proponent participate in feasibility of such an access if the Town is interested?* The Proponent should work with the Town to determine the feasibility of participating in this improvement.

The Town of Plymouth comments *'The Town offers the following general guidance in preparing the design aspects of the roadways: minimum main road widths of 22' are requested by the Fire Chief in the event that roadway width wavers are sought by the Proponent; construction of the traveled way within the layout is to be located as far from proposed/existing homes as is feasible; prefer use offset sidewalk plate (in the Subdivision Rules & Regulations) without clear-cut of the layout, to preserve trees and vegetation; and road surfacing should be designed to reduce traffic noise from tires.'* The Proponent should meet all minimum geometric requirements. When this is not possible the Proponent should work with the Town to determine the safest compromise possible.

The Town of Plymouth comments *'While traffic management and road safety are important issues, the Town is interested in negotiating for a land set-aside for municipal services such as fire/police, library, post office, cemetery, and/or recreational fields. Land set aside for a school bus has been discussed with Makepeace officials, and they have settled that this amount of land may not be economically viable for the project as proposed. All parties are willing to continue discussing options and working towards possible solutions.'* The Proponent should work with the Town and its subcommittees to assure any necessary land is set aside for municipal services in order to ensure the livability of the community.

This summarizes JEK's comments on the DEIR at this time. Additional review will be necessary to address the following supplemental items to be provided by VAI at a later date:

Additional Reviews

If authorized, JEK will review supplemental information to be provided by Vannasse Hangen Brustlin, Inc. as it becomes available to the Town. This includes the review of the following:

- Local Roadway Study evaluating traffic patterns, safety and traffic calming features for the roadways proximate to the Project.
- Pedestrian and bicycle master plan for the Project and immediate vicinity.
- Truck route study for the roadways providing access to the Project.
- Traffic monitoring and reporting program.
- Refinement of elements of the transportation improvement program for the Project.
- Conceptual improvement plans for the off-site roadway and intersection improvements.
- A schedule of mitigation currently expected to be completed by other proponents.