MEMORANDUM

TO: Ms. Leedara Zola
Land Acquisition and Permitting
Habitat for Humanity of Cape Cod
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FROM: Mr. Jeffrey S. Dirk, P.E., PTOE, FITE
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DATE: January 3, 3017

RE: 7524

SUBJECT: Transportation Impact Assessment
Proposed Residential Development - 93 and 97 Main Street (Route 28)
West Harwich, Massachusetts

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in support of the proposed residential community to be located at 93 and 97 Main Street (Route 28) in the Village of West Harwich in Harwich, Massachusetts (hereafter referred to as the "Project"). This assessment provides an existing conditions context for the Project with regard to its interface with the transportation infrastructure and includes: i) traffic volume projections for the residential community; ii) a qualitative assessment of potential impacts; iii) a review of lines of sight at the proposed access roadway; and iv) recommendations with regard to the design and operation of the roadway that will serve the Project.

Based on this evaluation, we have determined that the Project will not result in a significant increase in traffic to the extent that it would cause a material increase in motorist delays or vehicle queueing over current conditions. Accordingly and with implementation of the recommendations provided herein, we have concluded that the transportation infrastructure should afford sufficient capacity to accommodate the Project in a safe and efficient manner. We note that the Project will require the issuance of a State Highway Access Permit from the Massachusetts Department of Transportation (MassDOT) for access to Main Street (Route 28), a State Highway under MassDOT jurisdiction.

The following details our assessment of the Project.

PROJECT DESCRIPTION AND EXISTING CONDITIONS CONTEXT

Project Description

As proposed, the Project will entail the construction of six (6) single-family homes to be situated on a portion of a 2.466 acre parcel of land located at 93 and 97 Main Street (Route 28) in the Village of West Harwich in Harwich, Massachusetts. At present, the Project site contains a single-family home at 93 Main Street, a multi-family home at 97 Main Street that includes a detached cottage unit, and areas of open and wooded space. Access to the Project site will be provided by way of a new roadway that will intersect the south side of Main Street at the location of the driveway that serves the existing home

located at 93 Main Street. In conjunction with the Project, the existing residential homes and the cottage will be retained, and six (6) new single-family homes will be constructed in the southern portion of the Project site.

Existing Conditions Context

Main Street (Route 28) is a two-lane, urban principal arterial roadway that is under the jurisdiction of MassDOT and traverses a general east-west alignment through Harwich. In the vicinity of the Project site, Main Street is approximately 24-feet in width (paved area) and provides two 11-foot wide travel lanes separated by a double-yellow centerline with 1-foot wide marked shoulders provided. The posted speed limit along Main Street in the vicinity of the Project site is 35 miles per hour (mph).

A review of the MassDOT statewide High Crash Location List did not indicate any listed locations in the vicinity of the Project site.

A sidewalk is provided along the north side of Main Street opposite the Project site. Main Street does not provide sufficient width (combined travel lane and shoulder) on a consistent basis to support bicycle travel in a shared traveled-way configuration.[1] The Cape Cod Rail Trail is located to the north of the Project site and traverses an alignment to the south of Great Western Road, with the closest access to the Project site provided at the Bells Neck Road trail crossing, approximately 1.5 miles north of the Project.

The Cape Cod Regional Transit Authority (CCRTA) provides public transportation services along Main Street that are available to the Project site by way of bus service on the H2O Line. The H2O Line provides service along Route 28 between the Hyannis Transportation Center and the Stop & Shop Supermarket in Orleans. The closest bus stop to the Project site is located at the Dennis Municipal Parking Lot which is approximately 0.5 miles west of the Project site; however, CCRTA buses will stop anywhere along their service route where it is safe to pick-up or discharge passengers.

PROJECT-GENERATED TRAFFIC

In order to determine the traffic characteristics of the Project, trip-generation methodologies established by the Institute of Transportation Engineers (ITE)[2] were used. The ITE provides trip-generation information for various types of land uses developed as a result of scientific studies that have been conducted over the past 50 plus years, the most recent update of which was published in 2012. This data includes trip estimates for land uses that are similar to those that are to be located within the Project site. ITE Land Use Code (LUC) 210, *Single-Family Detached Housing*, was used to develop the traffic characteristics of the Project.

Table 1 summarizes the trip-generation calculations for the Project using the above methodology.

[1] A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.

[2] *Trip Generation*, 9th Edition; Institute of Transportation Engineers; Washington, DC; 2012.

Table 1
TRIP GENERATION SUMMARY

Time Period/Direction	Vehicle Trips Proposed Residential Community (6 Homes)[a]
Average Weekday Daily:	
Entering	29
Exiting	29
Total	58
Weekday Morning Peak Hour:	
Entering	1
Exiting	4
Total	5
Weekday Evening Peak Hour:	
Entering	4
Exiting	2
Total	6

[a]Based on ITE LUC 210, *Single-Family Detached Housing.*

Project-Generated Traffic Summary

As can be seen in Table 1, the Project is expected to generate approximately 58 vehicle trips on an average weekday (two-way, 24-hour volume, or 29 vehicles entering and 29 exiting), with approximately 5 vehicle trips (1 vehicle entering and 4 exiting) expected during the weekday morning peak-hour and 6 vehicle trips (4 vehicles entering and 2 exiting) expected during the weekday evening peak-hour. ***Such increases (one (1) additional vehicle every 10 to 12 minutes during the peak hour) would not result in a material increase in motorist delays or vehicle queuing over existing conditions.***

SIGHT DISTANCE ASSESSMENT

Lines of sight to and from the Project site roadway intersection with Main Street were provided by Down Cape Engineering, Inc. These measurements indicate that the sight line looking to the west from the Project site driveway is approximately 425 feet (limited by the horizontal curve to the west of the Project site roadway), with the sight line looking to the east found to be approximately 980 feet. Lines of sight along Main Street approaching the Project site roadway intersection exceed 500 feet in both directions. These sight lines are appropriate for an approach speed of up to 50 mph along Main Street, which is well in excess of the posted speed limit of 35 mph in the vicinity of the Project site, indicating that the Project site roadway is appropriately located along Main Street to function in a safe manner.

SUMMARY

VAI has prepared a TIA in support of the proposed residential community to be located at 93 and 97 Main Street (Route 28) in the Village of West Harwich in Harwich, Massachusetts. This assessment has provided an existing conditions context for the Project with regard to its interface with the transportation infrastructure and included: i) traffic volume projections for the residential community; ii) a qualitative assessment of potential impacts; iii) a review of lines of sight at the proposed access roadway; and iv) recommendations with regard to the design and operation of the roadway that will serve the Project, a discussion of which follows. We note that the Project will require the issuance of a State Highway Access Permit from the MassDOT for access to Main Street (Route 28), a State Highway under MassDOT jurisdiction.

Based on this evaluation, we have determined that the Project will not result in a significant increase in traffic to the extent that it would cause a material increase in motorist delays or vehicle queueing over current conditions. Accordingly, we have concluded that the transportation infrastructure should afford sufficient capacity to accommodate the Project in a safe and efficient manner. This conclusion is predicated on implementation of the following specific recommendations that should be advanced as a part of the Project:

1. The Project site roadway should be a minimum of 20-feet in width and be designed with appropriate geometry to accommodate the turning and maneuvering requirements of a single-unit truck (SU-30/40 design vehicle, which is typical of a trash/recycling vehicle and maintenance truck) and the largest anticipated responding emergency vehicle as defined by the Town of Harwich Fire Department.

2. Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.

3. All signs and pavement markings to be installed within the Project site shall conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[3]

4. Signs and landscape features to be installed along the Project site roadway, internal to the Project site and within the site triangle area of the Project site roadway intersection with Main Street, shall be designed and maintained so as not to restrict lines of sight.

5. Snow windrows along the Project site frontage on Main Street within the sight triangle areas of the Project site roadway shall be promptly removed where such accumulations would exceed 2.5-feet in height.

With implementation of the above recommendations, safe and efficient access can be provided to the Project site and the Project can be accommodated within the confines of the existing transportation infrastructure.

cc: File

[3] *Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.