



Professional Services  
Corporation, PC

## Memorandum

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TOWN CLERK BOURNE

**Date** July 20, 2021  
**To** Bourne Zoning Board of Appeals  
**From** Thomas C. Houston, PE, AICP  
**Project** Cape View Way Comprehensive Permit Project  
**Subject** Peer Review of the Transportation Impact Assessment (TIA)

Professional Services Corporation, PC (PSC) reviewed the Transportation Impact Assessment (TIA) for the Cape View Way Comprehensive Permit Project (Proposed Project) on behalf of the Bourne Zoning Board of Appeals.

The Preservation of Affordable Housing, Inc. (Applicant) proposes construction of a 51-unit mid-rise multifamily residential building on Cape View Way located on the north side of Meetinghouse Lane between the Post Office and Bourne Fire Station 3. Cape View Way was a previously approved subdivision road which was never completed. Currently, Cape View Way includes a paved roadway stub with the remainder unpaved. To serve the Proposed Project, construction of Cape View Way will be completed providing a 24-ft. wide paved traveled with a 5± ft. wide sidewalk on one side. When completed, Cape View Way will extend for approximately a 650 ft. to a cul-de-sac which has been adapted to serves as a drop-off area for the building's main entrance. A total of 85 parking spaces (69 standard parking spaces/12 compact parking spaces/4 accessible parking spaces) are proposed.

With the Proposed Project, Cape View Way will access Meetinghouse Lane at an unsignalized intersection that is proposed to operate under stop control. In proximity to the Project Site, Meetinghouse Lane carried an Average Weekday Traffic (AWT) Volume of 8,110 vehicles per day based on an April 2021 Automatic Traffic Recorder (ATR) Count with 489 vehicles per hour (K=6.0, 62% WB) counted during the weekday morning peak hour and 645 vehicles per hour (K=8.0, 59% WB) counted during the weekday evening peak hour. The Proposed Project's 51

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mid-rise multifamily dwelling units will generate 276 vehicle trips on a weekday with 18 trips (5 entering/13 exiting) generated during the Weekday Morning Peak Hour and 23 trips (14 entering/9 exiting) generated during the Weekday Evening Peak Hour.

Overall, we find that the Transportation Impact Assessment for Cape View Way prepared by Vanasse & Associates inc (VAi) is properly prepared and generally complies with the MassDOT Transportation Impact Assessment (TIA) Guidelines and with standard engineering practice. We offer the comments provided herein for consideration.

#### **BASIS**

- A. Transportation Impact Assessment, Proposed Multifamily Residential Development, Cape View Road, Bourne, Massachusetts prepared for Preservation of Affordable Housing, Inc., Bourne, Massachusetts, prepared by Vanasse & Associates inc (VAi ) dated May 2021.
- B. Cape View Way Permitting Plans, Bourne Massachusetts, Landscape Rendering, prepared for Preservation of Affordable Housing, Inc., Bourne, Massachusetts, prepared by Horsley Witten Group Inc.

#### **REFERENCE**

- A. MassDOT Transportation Impact Assessment (TIA) Guidelines (2014).

#### **STUDY METHODOLOGY**

In preparing the submitted Transportation Impact Assessment (TIA) Vanasse & Associates inc (VAi) consulted the Town of Bourne and utilized the MassDOT Transportation Impact Assessment (TIA) Guidelines. The TIA includes assessment of existing and future conditions and provision of recommendations for measures to mitigate traffic impacts. Intersection operations were evaluated using the procedures of the Highway Capacity Manual using in the Synchro® 11. Computer model. Overall, we find the methodology to be consistent with the MassDOT TIA Guidelines and standard engineering practice.

#### **TRANSPORTATION STUDY AREA**

The Transportation Study Area encompasses 3 intersections: the signalized Meetinghouse Lane/Route 3A/Canal Street Intersection, the unsignalized Meetinghouse Lane/Scusset Beach Road/Old Plymouth Road Intersection, and the unsignalized Meetinghouse Road/Cape View Way/54 Meetinghouse Lane Driveway Intersection which provides access to the Project Site.



Given the magnitude of the traffic volumes generated by the Proposed Project, we consider the extent of the Transportation Study Area to be sufficient.

### **TRAFFIC VOLUMES**

VAi obtained automatic traffic recorder (ATR) counts, manual turning movement counts (TMCs), vehicle classification counts, and vehicle speed data on Tuesday April 27<sup>th</sup> and Wednesday April 28<sup>th</sup>, which properly represent midweek conditions.

### **TRAFFIC VOLUME ADJUSTMENTS**

In order to account for the reduced 2021 traffic volumes resulting from the Massachusetts Safer at Home Order and the Phased Reopening Massachusetts Plan, the counted traffic volumes were increased by 23.8%. We consider this adjustment to be sufficient.

Traffic volume counts for the proposed project were taken in the month of April which is a below average month of the year for traffic volumes. Accordingly, the VAI increased the counted traffic volumes by 1.9% to adjust to Average Season traffic volumes based upon analysis of traffic volume data from MassDOT Continuous Count Station Number 708 located on the Mid Cape Highway in Bourne.

Although the Proposed Project falls below the threshold where compliance is required, the requirements for transportation impact assessment set forth in the Cape Cod Commission's Technical Bulletin 96-003 provides valuable guidance on methodologies appropriate for preparing transportation impact assessments in Bourne.<sup>1</sup> Technical Bulletin 96-003 requires an analysis of Existing, No Build, and Build traffic volumes for both Average Season and Peak Season cases.

To initially indicate the magnitude of the required Peak Season adjustment, we reviewed Monthly Traffic Volume data for MassDOT Count Station 708 on the Mid Cape Highway in Bourne. For consistency with the VAI analysis, we used 2019 traffic volume data.

The Monthly Average Daily Traffic Volume for the month of July 2019 was 80,269 vehicles. The Monthly Average Daily Traffic Volume for the month of April 2019 was 60,491 vehicles. In order to evaluate Peak Season traffic, the counted traffic volumes should be increased by an additional 31.7% or such other factor as VAI may develop. See Table 1.

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<sup>11</sup> Cape Cod Commission, Technical Bulletin 96-003, Guidelines for Transportation Impact Assessment.



**Table 1 Recommended Traffic Volume Adjustments**

	Average Season	Peak Season
Seasonal Adjustment	1.9%	31.7%
COVID-19 Adjustment	23.8%	23.8%
Counted Volume	6,426	6,426
Adjusted Volume	8,110	10,480

We recommend that Peak Season traffic volumes be developed and intersection operations be evaluated for the Peak Season traffic volumes in addition to the Average Season traffic volumes provided in the submitted TIA.

**OTHER EXISTING CONDITIONS**

We find the VAI analysis of other existing conditions is consistent with the MassDOT TIA Guidelines and standard engineering practice. A field inventory of pedestrian, bicycle, and public transportation facilities within the TSA was provided. Vehicle speed on Meetinghouse Lane was quantified from ATR data with 85<sup>th</sup> percentile speeds of 37 miles per hour eastbound and 36 miles per hour westbound. Vehicle crash rates were calculated for the three TSA intersections using data for the most recent 7-year period. The Meetinghouse Lane/Route 3A/Canal Street Intersection crash rate was below the State and District crash rates for signalized intersections and the Meetinghouse Road/Cape View Way/54 Meetinghouse Lane Driveway Intersection and Meetinghouse Lane/Scusset Beach Road/Old Plymouth Road Intersection crash rates were below the State and District crash rates for unsignalized intersections.

**FUTURE GROWTH AND NO-BUILD VOLUMES**

The VAI analysis of future growth and the 2028 No-Build Traffic Volumes is sufficient for an Average Season analysis but should be supplemented with a Peak Season analysis. VAI contacted the Town of Bourne and determined that there is no specific development by others that will impact the TSA. VAI evaluated traffic volume data from permanent counting stations located in Bourne and calculated an average traffic growth rate of 0.4%. As a conservative analysis, VAI developed the 2028 No-Build traffic volumes using a 1% increase per year compounded annually for seven years as the background growth rate.



VAi contacted the town of Bourne and determined that there were no near-term roadway improvement projects impacting the TSA. Long term plans for replacement of the Sagamore bridge were noted.

### **PROJECT GENERATED TRIPS**

The VAI trip generation calculations are consistent with the MassDOT TIA Guidelines and standard engineering practice. . For the 51 unit multifamily. residential development, trip generation was forecast using the trip generation rates for ITE Land Use Code 221 Multifamily Housing (Mid-Rise)<sup>2</sup>. The 51 residential units will generate 276 vehicle trips (138 entering 138 exiting) on a Weekday. The Project will generate 18 vehicle trips during the Weekday Morning Peak Hour (5 entering/13 exiting). The project will generate 23 vehicle trips during the Weekday Evening Peak Hour (14 entering/9 exiting).

### **FUTURE BUILD TRAFFIC VOLUMES**

Trip distribution and assignment are consistent with the MassDOT TIA Guidelines and standard engineering practice. The trips generated by the Proposed Project were distributed and assigned to the roadway network in the TSA based upon analysis of US Census Journey to Work Data with the highest number of trips.(72% of entering trips/50% of exiting trips) assigned to the Scenic Highway west of the Meetinghouse Lane/Route 3A/Canal Street Intersection.

Overall, the trips generated by the Proposed Project represent a relatively small addition to the existing traffic volumes in the TSA. Traffic volumes for the most heavily impacted roadway segment, the Scenic Highway west of the Meetinghouse Lane/Route 3A/Canal Street Intersection increased by 7/10 of 1%.

### **INTERSECTION OPERATIONS**

The analysis of intersection operations is sufficient for an Average Season conditions but should be supplemented with an analysis of Peak Season conditions.

The submitted Average Season analysis is based on the methodology of the Highway Capacity Manual utilizing Synchro® 11 software and is sufficient.

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<sup>2</sup> Institute of Transportation Engineers, Trip Generation Manual, Version 5.0 (Updates),10th Edition (September 2017)+Supplement (February 2020).



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VAi determined that the signalized Meetinghouse Lane/Route 3A/Canal Street Intersection operates at LOS C Weekday Morning (2021 Existing, 2028 No-Build, and the 2028 Build) and at LOS C (2021 Existing) or LOS D (2028 No-Build and 2028 Build) Weekday Evening. Comparing operations with the 2028 No-Build vs the 2028 Build traffic volumes, there is no change in level-of-service, the increase in control delay is less than 1 second, and 95<sup>th</sup> percentile queue lengths remain unchanged or increase by a maximum of 1 vehicle.

VAi determined that the Old Plymouth Road northbound approach to the unsignalized Meetinghouse Lane/Scusset Beach Road/Old Plymouth Road Intersection operates at LOS C Weekday Morning (2021 Existing, 2028 No-Build, and 2028 Build) and at LOS C (2021 Existing) or LOS D (2028 No-Build and the 2028 Build) Weekday Evening. The Old Plymouth Road southbound approach operates at LOS B during both the Weekday Morning and Weekday Evening (2021 Existing, 2028 No-Build, and 2028 Build). Comparing operations with the 2028 No-Build traffic volumes vs the 2028 Build traffic volumes, there is no change in level-of-service or 95<sup>th</sup> percentile queue lengths on either approach.

VAi determined that the Cape View Way approach to the Meetinghouse Road/Cape View Way/54 Meetinghouse Lane Driveway Intersection operates at LOS B Weekday Morning and at LOS C Weekday Evening (2021 Existing, 2028 No-Build, and 2028 Build). Comparing operations with the 2028 No-Build traffic volumes vs the 2028 Build traffic volumes, there is no change in level-of-service and the 95<sup>th</sup> percentile queues are zero.

#### **SIGHT DISTANCE**

VAi correctly evaluated required Stopping Sight Distance (SSD) and desirable Intersection Sight Distance (ISD) using measured 85<sup>th</sup> percentile speed data obtained from Automatic Traffic Recorder (ATR) Counts. Measured SSD is greater than the required SSD on Meetinghouse Lane eastbound and westbound. Measured ISD is greater than the calculated ISD looking east and west from the Cape View Way approach.

#### **TIA RECOMMENDATIONS**

We concur with the VAI recommendations for project access including a 24-ft. pavement width, stop sign control at Meetinghouse Lane, signage, and a sidewalk.

We also concur with the VAI recommendations for Transportation Demand Management (TDM), including designation of a transportation coordinator, posting public transportation service information, providing residents with a welcome packet that includes transportation



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information, constructing a sidewalk on Cape View Way, providing a central mailbox facility, and providing on site secure bicycle parking.

#### **PEDESTRIAN AND BICYCLE ACCESS**

The site plan provides good pedestrian access with a walkway that connects the building entrance with the on-site parking areas and extends to meet the existing sidewalk on Meetinghouse Lane.

The width of the proposed on-site walkway is not dimensioned but scales approximately 5 ft. Care must be taken not to place signposts, hydrants, and other obstructions that could restrict the accessible route. In two locations, the sidewalk is placed at the head of perpendicular parking spaces. Bumper overhang of 2 to 2½ feet can be accepted which would narrow the accessible route to an unacceptable 2½ to 3 ft. We recommend widening the sidewalk to 7½ ft. in these locations, providing parking bumper blocks, or providing a loam strip to maintain a minimum accessible route.

We concur with the VAI recommendation that secure indoor bicycle access be provided. Further, we recommend that an outdoor bicycle rack be provided for visitors.

#### **SITE ACCESS, CIRCULATION, AND PARKING**

There are 4 compact parking perpendicular parking spaces that are accessed from the pavement within the turnaround at the building entrance. The overall width of this parking bay is approximately 33 ft. (scaled) which will make accessing the parking space difficult. We recommend a minimum overall bay width of 42 ft. to ensure proper vehicle maneuvering.

The turnaround with center island at the end of Cape View Way that has been adapted to serve as a drop-off at the building entrance has an outer diameter (scaled) of approximately 98 ft. and an inner diameter (scaled) of approximately 68 ft. The outer radius should be sufficient, but the inner radius should be reduced by widening the pavement in order to accommodate a fire truck or other large vehicles. An AASHTO S-BUS 40 design vehicle used by many fire departments to emulate their fire apparatus has a minimum outer turning diameter of approximately 85 ft. and a minimum inner turning diameter of approximately 50 ft. We recommend that a vehicle swept path plan be prepared to better define the required shape of the island. Consultation with the Fire Department is recommended to identify design vehicle requirements. In addition to accommodating fire apparatus, the size of the center island should be reduced as necessary in order to accommodate the largest non-emergency vehicle regularly using the turnaround.



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Although the overall length of Cape View Way is only 650± ft., the potential to block emergency vehicle access is always a concern for a single entrance site. We recommend that signs be provided prohibiting parking along Cape View Way.

A total of 85 parking spaces (69 standard parking spaces/12 compact parking spaces/4 accessible parking spaces) are proposed to serve the 51 residences. We quantified peak parking demand based upon the Institute of Transportation Engineers (ITE) Parking Generation Manual<sup>33</sup>. For ITE Land Use 221 Multifamily Housing (Mid-Rise), peak period parking demand on a weekday in a general urban/suburban setting (no nearby rail transit) for 51 dwelling units is 60 parking spaces. The proposed 85 parking spaces should be sufficient. Although not anticipated, should additional parking ever be needed there are areas on-site where additional parking spaces could be added.

#### **CONSTRUCTION MANAGEMENT PLAN**

A draft Construction Management Plan should be submitted that provides for minimization of overall construction phase vehicle trips including single occupant vehicle trips. Prior to construction, this draft plan can be refined through consultation with the Police Department and the Department of Public Works.

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<sup>33</sup> ITE Parking Generation Manual 5<sup>th</sup> Edition , January 2019, Institute of Transportation Engineers.