



December 4, 2024

Greg Wirsen, MSc.  
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114 State Road  
Sagamore Beach, MA 02562

**RE: Supplemental Traffic Memorandum  
Canal Crossing Mixed-Use Development  
Bourne, MA**

Bowman has prepared this supplemental traffic memorandum for the proposed Canal Street Crossing mixed-use development (herein referred to as the "Project") to be located at 21 Hunters Brook Road, in Bourne (Sagamore Beach), Massachusetts. Bowman previously prepared a Traffic Assessment, dated March 11, 2024, to outline the proposed modification to the build program from what was presented in the Traffic Impact and Access Study (TIAS), prepared by Vanasse Hangen Brustlin, Inc. (VHB), dated February 2019.

The purpose of this memorandum is to provide additional details regarding the on-site circulation, site access, and trip distribution associated with the modified build program as discussed with the Cape Cod Commission (CCC) on November 6, 2024.

**Site Access and Circulation**

The modified build program would include the construction of an approximate 35,380 square foot (s.f.) medical office building (MOB) and 32 age-restricted condominiums. The Project site would be accessed via two site driveways, one located on Canal Street that would primarily serve the MOB, and one located on Hunters Brook Road that would primarily serve the condominiums. The site driveway on Canal Street would provide ingress to the site and right-turn only egress. The site driveway on Hunters Brook Road would operate as a full access driveway. A one-way internal connection would be provided from the condominium parking area to the MOB parking area that would allow vehicles exiting the residential portion of the site to exit onto Canal Street.

The trip generation estimates associated with the modified build program were presented in the March 2024 Traffic Assessment. The updated trip generation is reflective of the removal of the 88,940 s.f. assisted living facility from the original build program; a reduction in the size of the MOB (previously 39,312 s.f.); and the addition of 17 age-restricted condominiums, for a total of 32 units. The unadjusted trip generation estimates associated with the modified build program, as presented in March 2024 Traffic Assessment, are summarized in Table 1 below.

**Table 1: Unadjusted Vehicular Trip Generation for Modified Build Program**

Land Use	Size	Weekday Daily			Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
MOB <sup>(1)</sup>	35,380 sf	706	706	1,412	75	20	95	42	99	141
Age-Restricted Condominiums <sup>(2)</sup>	32-units	112	112	224	5	11	16	11	7	18
<b>TOTAL</b>		<b>818</b>	<b>818</b>	<b>1,636</b>	<b>80</b>	<b>31</b>	<b>111</b>	<b>53</b>	<b>106</b>	<b>159</b>

(1) ITE Land Use Code 720 (Medical-Dental Office Building) based on 35,380 sf.

(2) ITE Land Use Code 251 (Senior-Adult Housing, Single-Family) based on 32 dwelling units.

Based on the trip distribution presented in the February 2019 VHB TIAS and the March 2024 Bowman Traffic Assessment, 100% of trips accessing the site would be traveling to/from the north via Canal Street to access Route 3 and other destinations and connector roadways on Meetinghouse Lane/Scenic Highway (US Route 6). Based on the layout of the site, it is considered that the internal connection between the two uses may serve a portion of the condominiums located on the northeast corner of the site. Based on the proposed configuration of the condominium driveways and overall ease of access, it is considered that the internal driveway may be used to exit the site by approximately 30% of the condominium units (10 of the 32 units).

A comparison of the unadjusted trip generation estimate associated with the modified build program (shown above in Table 1) to the unadjusted trip generation presented in the February 2019 TIAS is presented in Table 2.

**Table 2: Vehicle Trip Generation Comparison by Use (Original vs. Modified Build Program)**

Time Period	Previous <sup>(1)</sup>				Updated <sup>(2)</sup>			Difference
	MOB	Assisted Living	Condos	TOTAL	MOB	Condos	TOTAL	
Weekday Daily	1,422	234	106	1,762	1,412	224	1,636	-126
Weekday Morning Peak Hour	97	17	10	124	95	16	111	-13
Weekday Afternoon Peak Hour	135	24	11	170	141	18	159	-11

(1) As presented in the VHB February 2019 TIS. Based on ITE's Trip Generation Manual, 10th Edition.

(2) As presented in Table 1. Based on the updated build program and ITE's Trip Generation Manual, 11th Edition.

As presented in Table 2, the total daily (unadjusted) trips associated with the development under the modified build program would be 1,636 trips, with 1,412 of the daily trips associated with the MOB. Under the original build configuration, the MOB and assisted living facility would have accessed the site via the Canal Street driveway. The unadjusted daily trips associated with the MOB and assisted living facility as presented in the February 2019 TIAS were estimated at 1,656 trips per day. Based on this comparison, there would be a net reduction of approximately 244 daily trips, 19 trips during the weekday morning peak hour, and 18 trips during the weekday afternoon peak hour accessing the site via the Canal Street driveway.

Based on the trip generation presented in Table 1 and the considered use of the internal egress connection for condominium residents (30%), it is estimated that approximately 34 daily exiting trips associated with the condominiums would utilize the internal connection, with approximately 3 exiting trips occurring during the weekday morning peak hour and approximately 2 exiting trips occurring during the weekday afternoon peak hour. Even with including these additional trips that would utilize the Canal Street driveway via the internal connection, the number of trips accessing the site via the Canal Street driveway would be less than what was previously approved as part of the original build program. It is considered that the operations of the Canal Street driveway would be comparable to or improved from the capacity analysis results presented in the February 2019 TIAS.

### Sight Distance

A field review of the available sight distance was conducted on Wednesday, November 20, 2024, at the two proposed site driveways to confirm the sight distance evaluation presented in the February 2019 TIAS.

The American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on Geometric Design, 2018 Edition*, defines minimum and recommended sight distances at intersections. The minimum sight distance is based on the required stopping sight distance (SSD) for vehicles traveling along the main road. The recommended sight distance allows vehicles to enter the main street traffic flow without requiring the mainline traffic to slow to less than 70% of their speed and is referred to as intersection sight distance (ISD). According to AASHTO, "If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient time to anticipate and avoid collisions."

The sight distance evaluation presented in the February 2019 TIAS indicated that the required SSD and recommended ISD are met at both proposed site driveway locations based on the measured 85<sup>th</sup> percentile operating speeds on Canal Street and Hunters Brook Road. The sight distance measurements completed during the November 2024 field review concur with the measurements presented in the February 2019 TIAS, which are summarized in Table 3.

**Table 3: Sight Distance Summary**  
(As presented in February 2019 TIAS)

Site Driveway Location	Approaching	85th %	SSD <sup>1</sup>		Meets	ISD <sup>2</sup>		Meets
		Speed (mph)	Required	Measured	Required SSD?	Recommended	Measured	Recommended ISD?
Canal Street	Northbound	32	220'	400'	Yes	n/a	n/a	n/a
at Site Driveway	Southbound	33	230'	260'	Yes	365	600'+	Yes
Hunters Brook Road	Eastbound	28	190'	500'+	Yes	320'	500'+	Yes
at Site Driveway	Westbound	29	190'	500'+	Yes	320'	500'+	Yes

<sup>1</sup> Stopping sight distance (see AASHTO equations 3-2 and 3-3) for the 85th percentile speeds.

<sup>2</sup> Intersection sight distance (see AASHTO equations 9-1 and 9-2) for the 85th percentile speeds.

The available sight lines at both site driveways were found to meet or exceed the measurements presented in the February 2019 TIAS. As such, the required SSD and recommended ISD would be exceeded at both proposed site driveways. It is recommended that existing and proposed vegetation be maintained and plantings within the vicinity of the sight lines remain below 2.5 feet in height.

## Conclusions and Recommendations

Based on a review of the on-site circulation and site access proposed as part of the modified build program, the proposed one-way internal connection from the condominium building to the medical building would reduce the number of trips generated by the condominiums that are exiting the site onto Hunters Brook Road. However, the number of trips estimated to use the internal connection is considered to be less than five combined exiting trips during the weekday morning and weekday afternoon peak hours. With the internal connection in place, the total number of trips exiting the site via the Canal Street driveway would be less than what was presented in the February 2019 TIAS due to the reduced MOB size and removal of the assisted living facility.

The additional residential trips exiting the site via the Canal Street driveway would not be anticipated to impact the capacity analysis results and findings presented in the February 2019 TIAS. In addition, a November 2024 field review of available sight distances concurs with the sight distance measurements presented in the February 2019 TIAS, indicating that the required SSD and recommended SSD are met at both proposed driveway locations based on measured 85<sup>th</sup> percentile operating speeds.

Overall, the site access and circulation proposed as part of the modified build program for the Project are consistent with the findings presented in the February 2019 TIAS. The addition of the one-way internal connection between the proposed uses would not impact the overall findings that the Project is not anticipated to have a significant impact on the operations of the surrounding roadway network including Hunters Brook Road.

Please do not hesitate to contact us with any questions regarding the findings of this assessment.

Sincerely,

A handwritten signature in black ink, appearing to read 'Philip Viveiros', written in a cursive style.

Philip Viveiros, P.E., PTOE, RSP2I  
Senior Project Manager