Bowman

February 3, 2025

Greg Wirsen, MSc.
Green Seal Environmental, LLC
114 State Road
Sagamore Beach, MA 02562

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

Bowman has prepared this supplemental traffic memorandum to provide updated capacity analysis results 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 Supplemental Traffic Memorandum, dated December 4, 2024 to provide a comparison of the trip generation estimates associated with the modified build program to the trip generation estimates presented in the Traffic Impact and Access Study (TIAS), prepared by Vanasse Hangen Brustlin, Inc. (VHB), dated February 2019.

As presented in the December 4, 2024 Supplemental Traffic Memorandum, the modified build program includes the removal of the 88,940 square feet (s.f.) assisted living facility from the original build program; a reduction in the size of the medical office building (MOB) to 35,380 s.f.; and the addition of 17 age-restricted condominiums, for a total of 32 units. The modified build program would also include a one-way internal connection 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 additional age-restricted condominiums are estimated to generate 6 additional trips (one entering vehicle and five exiting vehicles) during the weekday morning peak hour, and 7 additional trips (four entering vehicles and three exiting vehicles) during the weekday afternoon peak hour, from what was presented in the VHB TIAS. Although a portion of these trips would utilize the internal connection to exit the site onto Canal Street, the additional age-restricted condominiums would increase the amount of vehicle trips accessing the site from Hunters Brook Road.

The purpose of this memorandum is to present an updated capacity analysis for the proposed site driveway on Hunters Brook Road to evaluate the impacts of these additional trips associated with the modified build program.

Updated Capacity Analysis

The VHB TIAS included intersection capacity analysis results based on Synchro capacity analysis software for the study area intersections. The 2026 Build Peak Summer Season capacity analysis results for the original build program are presented in Table 9 of the VHB TIAS. To evaluate the impacts associated with the 17 added age-restricted condominiums proposed as part of the modified build program, the additional trips associated with these units were added to the 2026 Build Peak Summer Season volumes for the Site Driveway at Hunters Brook Road presented in the VHB TIAS. The trips were distributed to enter and exit the Site Driveway at Hunters Brook Road based on the trip distribution presented in the VHB TIAS. Although a portion of the trips are considered to utilize the internal driveway connection to exit onto Canal Street, all trips were distributed to access the site through the Site Driveway on Hunters Brook Road to present a conservative analysis. The distribution of the additional trips is documented in the traffic projection model (TPM) provided as an attachment.

Synchro capacity analysis software was utilized to provide updated capacity analysis results for the intersection of the Site Driveway at Hunters Brook Road under the modified 2026 Build conditions. A summary of the 2026 Build Peak Summer capacity analysis results for the Site Driveway at Hunters Brook Road as presented in the VHB TIAS ("Previous 2026 Build") and based on the modified build program ("Modified 2026 Build") are presented in Table 1 below.

Table 1: Updated Peak Summer Capacity Analysis
Site Driveway at Hunters Brook Road

Peak Hour	Approach/ Movement		Previous 2026 Build[1]				Modified 2026 Build[2]			
			LOS[3]	Delay[4]	V/C[5]	Queue[6]	LOS	Delay	V/C	Queue
AM	EB	L	A	7.0	0.00	0	A	7.3	0.00	0
	SB	LR	A	8.0	0.01	0	A	8.4	0.01	0
PM	EB	L	A	7.0	0.00	0	A	7.3	0.01	0
	SB	LR	A	8.0	0.01	0	A	8.4	0.01	0

(1) - As presented in Table 9 (Unsignalized Intersection Capacity Analysis - Peak Summer Season) of the Traffic Impact and Access Study prepared by VHB dated February 2019.

(2) - Includes trips associated with additonal 17 age-restricted condominiums as part of the Modified Build Program.

(3) - Level-of-Service

(4) - Average vehicle delay, in seconds

(5) - Volume to capacity ratio

(6) - 95th percentile queue, in feet

As shown in Table 1, the capacity analysis results presented in the VHB TIAS, which are based on the original build program, show the Site Driveway at Hunters Brook Road operating at a level-of-service (LOS) A during both the weekday morning and weekday afternoon peak hours. Under the modified build program, with added trips from the additional age-restricted condominiums, the proposed driveway is anticipated to

continue to operate at LOS A during both peak hours, with a negligible increase in delay. The delay would remain internal to the project site, with no anticipated impacts to the flow of traffic on Hunters Brook Road.

Overall, the increase in vehicle trips to/from the project site associated with the additional age-restricted condominiums as part of the modified build program, would not impact the overall findings and conclusions presented in the VHB TIAS.

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

Sincerely,

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

Emily Buck, P.E.
Project Manager

Attachments

- Traffic Projection Model
- Modified 2026 Build Capacity/Level-of-Service Analysis

TRAFFIC PROJECTION MODEL

Canal Crossing
Weekday Morning Peak Hour - Peak Conditions
Bourne, MA

Intersection	Dir.	Turn	2026 Build Volumes[1]	Additional Condominiums PERCENT ENTER	Additional Condominiums Trips ENTER	Additional Condominiums PERCENT EXIT	Additional Condominiums Trips EXIT	Additional Condominiums Trips TOTAL	2026 Modified Build Volumes
Site Driveway at	EB	L	5	100%	1		0	1	6
Hunters Brook Road		T	15		0		0	0	15
	WB	T	15		0		0	0	15
		R	0		0		0	0	0
	SB	L	0		0		0	0	0
		R	5		0	100%	5	5	10

(1) - Based on Traffic Impact and Access Study dated February 2019, submitted by VHB.

TRAFFIC PROJECTION MODEL

Canal Crossing
Weekday Afternoon Peak Hour - Peak Conditions
Bourne, MA

Intersection	Dir.	Turn	2026 Build Volumes(1)	Additional Condominiums PERCENT ENTER	Additional Condominiums Trips ENTER	Additional Condominiums PERCENT EXIT	Additional Condominiums Trips EXIT	Additional Condominiums Trips TOTAL	2026 Modified Build Volumes
Site Driveway at	EB	L	5	100%	4		0	4	9
Hunters Brook Road		T	25		0		0	0	25
	WB	T	15		0		0	0	15
		R	0		0		0	0	0
	SB	L	0		0		0	0	0
		R	5		0	100%	3	3	8

(1) - Based on Traffic Impact and Access Study dated February 2019, submitted by VHB.

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	15	15	0	0	10
Future Vol, veh/h	6	15	15	0	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	16	16	0	0	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	16	0	-	0	46	16
Stage 1	-	-	-	-	16	-
Stage 2	-	-	-	-	30	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1602	-	-	-	964	1063
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	993	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1602	-	-	-	960	1063
Mov Cap-2 Maneuver	-	-	-	-	960	-
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	993	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1602	-	-	-	1063
HCM Lane V/C Ratio	0.004	-	-	-	0.01
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	25	15	0	0	8
Future Vol, veh/h	9	25	15	0	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	27	16	0	0	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	16	0	-	0	63	16
Stage 1	-	-	-	-	16	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1602	-	-	-	943	1063
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	975	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1602	-	-	-	937	1063
Mov Cap-2 Maneuver	-	-	-	-	937	-
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	975	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1602	-	-	-	1063
HCM Lane V/C Ratio	0.006	-	-	-	0.008
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0