



To: Mr. Chris Manning
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400 Locust Street, Suite 820
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Date: May 6, 2020

Memorandum

Project #: 13391.02

From: Robert L. Nagi, PE
Principal

Re: Traffic Impact Memorandum
Trip Generation Comparison
The Delaney at Montvale Commons
Woburn, Massachusetts

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Senior Project Engineer

Introduction

On behalf of the Proponent (LCS Development) working in conjunction with Montvale Land LLC, VHB has prepared a trip generation and access evaluation in support of the Special Permit in the City of Woburn for The Delaney at Montvale Commons, the senior housing and assisted living component of The Vale, the approved master-planned redevelopment project located in Woburn, Massachusetts.

This memorandum includes an evaluation of the trip generation and access needs for the currently proposed first phase of the development at the Project site. Specifically, this memo focuses on the senior housing and assisted living facility component and assesses any changes to the program from the previously reviewed and approved development that was the focus of a detailed traffic impact and access study submitted as part of the Environmental Impact Reports^{1,2} filed with the Commonwealth through the Massachusetts Environmental Policy Act (MEPA) and through the Development Agreement between the Master Developer and the City of Woburn. As detailed herein, the current senior housing and assisted living facility program is generally consistent with the approved master plan redevelopment and is expected to have only minor impacts on local traffic operations, even when combined with the Pulte development on an adjacent parcel.

Project Description

The overall master plan consists of the redevelopment of the Project Site, which encompasses approximately 77-acres in the City of Woburn along Interstate 93, with limited, undeveloped portions of the land extending into the adjacent Towns of Winchester and Stoneham Massachusetts at the site of the former Kraft Food Processing Plant. The full build program for the Project, as described in Table 1, will ultimately consist of up to 1,639,100 square feet of complementary mixed uses, anticipated to include residential, hotel, office/lab/flex/research & development, retail and restaurant uses.

This memo focuses on the traffic impacts associated with the first phase of the development, specifically the senior housing and assisted living component within the overall development program. The other elements will each be evaluated separately through their own design review process with the City. This portion of the development will

¹ Final Environmental Impact Report, The Vale, Woburn, MA; VHB, Inc; August 15, 2019.

² Draft Environmental Impact Report, The Vale, Woburn, MA; VHB, Inc; April 1, 2019.

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include 103 independent living units, 120 assisted living units (including 84 assisted living units and 36 memory care units). Additionally, 147 surface parking spaces, 46 garage spaces, and 1 dedicated shuttle space, totaling to 194 spaces, will be provided on site. The proposed development is shown in the accompanying site plans prepared by the Applicant's civil engineer.

▪ **Table 1 Originally Proposed Project Phasing**

Development Component	Phase I	Phase II	Phase III / Full Build	Final Development
Townhomes	75 units	-	-	75 units
Apartments	125 units	-	-	125 units
Senior Housing	100 units	-	-	100 units
Assisted Living	105 beds	-	-	105 beds
Medical Office Building	45,000 SF ±	-	-	45,000 SF ±
Hotel	135 keys	-	-	135 keys
R&D/Lab	-	360,000 sf ±	474,200 sf ±	834,200 SF ±
Retail/Restaurant	-	20,000 sf ±	63,200 sf ±	83,200 SF ±

As noted in Table 1, the development of the overall Project was divided into three specific phases. Phase 1 focused on the development of the residential, hotel, and medical office building and formed the basis for the initial buildout of the site. Accompanying the Phase 1 improvements was a series of additional construction activities on the site aimed at decommissioning the former Kraft Food processing plant and constructing access improvements. Phase 2 of the development focused on a significant amount of commercial Research & Development/office space along with some supporting retail uses. The final phase would see the construction of over a half-million SF of the same commercial/retail space on the site. Each phase was accompanied by a series of incremental off-site roadway improvements that have been reviewed and accepted by the Massachusetts Department of Transportation (MassDOT) which was the focus of the transportation sections of the MEPA submissions to the Commonwealth and are consistent with the Development Agreement between the City and the Master Developer.

Trip Generation Changes

As shown in Table 1 above, the original proposed program included 100 units of senior housing and 105 beds for the assisted living facility. Under the current proposed program, 103 units of senior housing and 130 beds of assisted living will be provided, reflecting an increase of 3 senior housing units and 25 beds for the assisted living facility.

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The Transportation Study contained in the DEIR included trip generation estimates for the proposed uses, projected using trip generation rates published by the Institute of Transportation Engineers (ITE) Trip Generation, 10th Edition³. Trip generation estimates were provided for each development Phase as well as the Full Build condition. As it relates to the proposed development, trips were estimated using the following Land Use Codes (LUC):

- LUC 254 (Assisted Living)
- LUC 255 (Senior Housing)

Table 2, shows that the approved senior housing and assisted living facility component of Phase I results in an estimate of between 40 to 62 peak hour trips to the Project Site. Given the slight increase in the number of units for senior housing and number of beds for assisted living facility under the currently proposed program, a revised trip generation analysis was conducted for the current proposal of 103 units of senior housing and 130 beds for assisted living facility. The results of this analysis are presented in Table 2.

³ Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, D.C., 2017.

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Table 2 Phase I Trip Generation

	MEPA Estimates for Senior Housing / Assisted Living ^b	Currently Proposed Senior Housing / Assisted Living ^b
Weekday		
Enter	325	363
Exit	<u>325</u>	<u>363</u>
Total	650	726
Weekday Morning		
Enter	20	23
Exit	<u>20</u>	<u>22</u>
Total	40	45
Weekday Evening		
Enter	24	28
Exit	<u>29</u>	<u>33</u>
Total	53	61
Saturday		
Enter	322	364
Exit	<u>322</u>	<u>364</u>
Total	644	728
Saturday Midday		
Enter	34	37
Exit	<u>28</u>	<u>32</u>
Total	62	69

a Trip generation for Phase I based on ITE LUC 252 for 100 units and ITE LUC 254 for 105 beds, no internal trip credit taken.

b Trip generation for Phase I based on ITE LUC 252 for 103 units and ITE LUC 254 for 130 beds, no internal trip credit taken.

As shown in Table 2, the currently proposed program results in slightly higher trips than the approved Phase I program from the MEPA filing. The slight increase in program size is expected to result in five to eight additional trips during each of the peak hours.

Traffic Operations Analysis

Measuring existing traffic volumes and projecting future traffic volumes quantifies traffic within the study area. To assess quality of flow, roadway capacity analyses were conducted for a revised 2026 Phase I Build condition with only the senior housing and assisted living component of Phase I included at the intersection of Montvale Avenue at Hill Street / I-93 Southbound Off-Ramps. This condition reflects the existing infrastructure at the intersection and the projected 2026 Build traffic volume for the senior housing and assisted living facility. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed on them. Calculated levels of service classify roadway operating conditions.

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Level-of-Service Criteria

Level of service (LOS) is the term used to denote the different operating conditions that occur on a given roadway segment under various traffic volume loads. It is a qualitative measure that considers a number of factors including roadway geometry, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

For signalized intersections, the evaluation criteria used to analyze study area intersections are based on the percentile-delay method (SYNCHRO results).

Intersection Capacity Analysis

Table 3 summarizes the capacity analyses for the signalized intersection of Montvale Avenue at Hill Street / I-93 Southbound Off-Ramp. The Table presents the revised Phase I Build conditions alongside the previously presented 2018 Existing and projected 2026 No-Build conditions.

As shown in Table 3, under 2026 Build conditions, the study area intersection is expected to operate at the same overall LOS than under 2026 No-Build conditions. With the addition of the projected senior housing and assisted living facility trips, some individual movements are expected to show a slight degradation in LOS, without any proposed roadway mitigation or signal timing adjustments in place. The Hill Street northbound approach experiences the largest increase in delay and queue, with a maximum of three (3) vehicles added to the 95th percentile queue during the peak hours.

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Table 3 Signalized Intersection Capacity Analysis

Location / Movement	2018 Existing Conditions					2026 No-Build Conditions					Phase I Senior Housing/Assisted Living Build Conditions				
	v/c ^a	Del ^b	LOS ^c	50 Q ^d	95 Q ^e	v/c	Del	LOS	50 Q	95 Q	v/c	Del	LOS	50 Q	95 Q
Montvale Avenue at Hill Street and I-93 SB Off-Ramp															
<i>Weekday Morning</i>															
EB T/R	0.57	26	C	133	199	0.65	31	C	187	247	0.66	31	C	195	249
WB L/U	0.37	44	D	29	76	0.65	57	E	81	151	0.67	59	E	88	158
WB T	0.57	18	B	158	234	0.57	19	B	214	278	0.57	20	B	220	278
NB L/T/R	0.49	13	B	0	52	0.76	35	C	65	#177	0.82	40	D	87	#227
SB L	0.94	65	E	205	#501	1.16	>120	F	~336	#596	1.18	>120	F	~355	#593
SB T	0.94	66	E	207	#504	1.14	>120	F	~331	#586	1.18	>120	F	~357	#595
SB R	0.91	38	D	138	#414	1.15	116	F	~321	#582	1.19	>120	F	~350	#596
Overall		35	D				65	E				71	E		
<i>Weekday Evening</i>															
EB T/R	0.80	31	C	306	409	0.95	49	D	393	#528	0.97	53	D	401	#534
WB L/U	0.35	50	D	28	68	0.65	63	E	81	142	0.68	65	E	89	152
WB T	0.47	19	B	150	220	0.45	20	B	182	233	0.46	20	B	182	233
NB L/T/R	0.54	17	B	5	50	0.84	46	D	93	#231	0.91	59	E	125	#298
SB L	0.61	39	D	158	275	0.72	50	D	196	#333	0.75	53	D	203	#345
SB T	0.61	39	D	160	277	0.72	50	D	196	#331	0.74	52	D	203	#343
SB R	0.82	27	C	139	#352	1.01	69	E	~285	#517	1.05	81	F	~307	#537
Overall		29	C				46	D				51	D		
<i>Saturday Midday</i>															
EB T/R	0.64	28	C	195	282	0.78	36	D	284	341	0.79	36	D	289	346
WB L/U	0.48	50	D	49	104	0.81	71	E	123	#229	0.84	74	E	132	#248
WB T	0.49	17	B	151	223	0.46	18	B	177	227	0.46	18	B	177	227
NB L/T/R	0.61	22	C	25	91	1.01	78	E	~179	#367	1.11	110	F	~233	#426
SB L	0.46	38	D	96	191	0.59	48	D	126	206	0.61	49	D	131	213
SB T	0.45	38	D	96	190	0.59	48	D	128	208	0.60	48	D	130	212
SB R	0.74	24	C	85	#265	1.01	74	E	~222	#422	1.04	81	E	~236	#435
Overall		26	C				44	D				50	D		

Phase I Traffic Improvements

As part of the proposed redevelopment project, a phased mitigation program has been approved which addresses the specific capacity needs for each of the development phases. Below is a description of the approved Phase I mitigation measures.

At the conclusion of the first phase of roadway upgrades, the improvements will focus on modernizing and upgrading the traffic signal system along Montvale Avenue in front of the Project Site and widening Hill Street. The Proponent has committed to upgrading the following three signalized intersections to provide for a fully adaptive signal system that is compliant with the other adaptive signal systems within the City of Woburn:

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- Montvale Avenue at Hill Street/ I-93 SB Off-Ramp.
- Montvale Avenue at I-93 NB Ramps.
- Montvale Avenue at Maple Street/ Unicorn Park Drive.

Additional intersection improvements will also be implemented during the first phase of development and will focus on upgrading the intersection of Montvale Avenue and the I-93 southbound off-ramps with Hill Street. Specifically, proposed geometric improvements include:

- Widening Hill Street to provide for an adequate cross-section which will provide at least two exit lanes and one entrance lane;
- Pedestrian accommodations along Hill Street that integrate with the current Montvale Avenue pedestrian network; and
- Necessary transitioning from Hill Street onto Montvale Avenue of pedestrian and bicycle accommodations.

These Phase I measures are the responsibility of the Master Developer of the site (Montvale Land LLC) and they are required to be fully operational prior to full occupancy of the entire Phase I development (see Table 1 previously). The capacity analysis presented in Table 3 indicates that the senior housing and assisted living component will only have minor impacts on the intersection if constructed prior to the implementation of Phase I improvements. At the conclusion of the Phase 1 improvements being in place, all signals and approaches are expected to operate at or above LOS D.

Conclusion & Recommendations

The proposed change in the number of units and beds to the senior housing and assisted living component of Phase I of the development is expected to result in a slight increase in vehicle trips (four to six trips) to and from the Project Site during the peak hours over what was previously reviewed. Based on the revised capacity analysis, the intersection of Montvale Avenue at Hill Street / I-93 Southbound Off-Ramp is expected to operate at the same overall LOS than under 2026 No-Build conditions. With the addition of the projected trips for the senior housing and assisted living component, while some individual movements are expected to show a slight degradation in LOS, overall the intersection has the capacity to accommodate the additional trips. VHB recommends that the Applicant consider the following:

- At 75% occupancy of the proposed senior housing and assisted living facility, the master developer (Montvale Land LLC) and City should review the signal operations and, if warranted, adjust the signal timings to account for the additional traffic along Hill Street (note: capacity analyses conducted find that signal timing adjustments will return the traffic signal to a comparable level of service as the expected no-build condition); and

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- Develop a clear wayfinding plan for visitors and deliveries arriving via Hill Street through the Project site to avoid on-going construction within the site.

From the traffic study outlined above, the proposed senior housing and assisted living facility is not expected to have a significant traffic delay/impact on the surrounding area roadways.