

MEMORANDUM

TO: Mr. Steve Dazzo
Development Associate
The Hanover Company
2 Seaport Lane, 11th Floor
Boston, MA 02210

FROM: Mr. Jeffrey S. Dirk, P.E., PTOE, FITE
Partner
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35 New England Business Center Drive
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DATE: March 26, 2019

RE: 7716

SUBJECT: Traffic Monitoring Program
Hanover Foxborough
Foxborough, Massachusetts

Vanasse & Associates, Inc. (VAI) has completed the traffic monitoring program for the Hanover Foxborough residential development located at 10 Fisher Street in Foxborough, Massachusetts (hereafter referred to as the "Project"). The monitoring program has been completed in accordance with requirements of Condition I.1 (b) of the September 16, 2015 Comprehensive Permit issued by the Town of Foxborough Zoning Board of Appeals for the Project. This condition requires that a traffic monitoring program be completed for the Project one (1) year after 80 percent of the residential units are occupied as follows:

One (1) year after eighty percent (80%) of the residential units of the Project are occupied, the Applicant shall conduct a post-development traffic monitoring and resident survey program in order to evaluate the success and to refine the elements of the Transportation Demand Management program and to validate the trip projection for the Project, at an anticipated cost of approximately fifteen thousand dollars (\$15,000.00).

It is our understanding that the Project achieved a 96 percent occupancy rate on January 28, 2019, just prior to the commencement of the traffic counts that form the basis of this traffic monitoring program. In accordance with the requirements Condition I.1 (b), traffic volume data was collected on the driveway serving the Project using an automatic traffic recorder (ATR) over a continuous 7-day, weeklong period commencing on Saturday, February 2, 2019, and concluding on Friday, February 8, 2019. Table 1 summarizes the traffic volume data collected for the Project at 96 percent occupancy.

Table 1
HANOVER FOXBOROUGH TRAFFIC VOLUME DATA
96 PERCENT OCCUPANCY

	Count Date						
	Saturday 2/2	Sunday 2/3	Monday 2/4	Tuesday 2/5	Wednesday 2/6	Thursday 2/7	Friday 2/8
Daily Traffic Volume (vehicles):	965	870	1,004	1,118	1,100	1,056	1,172
Morning Peak-Hour (vph):	41	40	66	86	79	79	83
Evening Peak-Hour (vph):	72	95	91	88	102	91	95

vph = vehicles per hour

Condition I.1 (b) of the September 16, 2015 Special Permit requires that the traffic volume data for the Project measured at one year after 80 percent occupancy be increased (pro-rated) to represent conditions at full (100 percent) occupancy and compared to the traffic volume projections for the Project at full occupancy that were presented in the February 2015 *Transportation Impact Assessment* (TIA) that was prepared by VAI in support of the Project.

The traffic count data and analyses that were presented in the February 2015 TIA represent conditions on an average weekday (i.e., Tuesday, Wednesday or Thursday). Averaging the measured daily and peak-hour traffic volumes presented in Table 1 for Tuesday, Wednesday and Thursday results in the following traffic volumes for the Project at 96 percent occupancy:

- **Average Weekday:** 1,092 vehicles per day
- **Morning Peak-Hour:** 82 vph
- **Evening Peak-Hour:** 94 vph

Following the requirements of Condition I.1 (b), the average weekday traffic volumes were then expanded (increased) by four (4) percent (multiplied by 1.04) in order to provide a prediction of traffic volumes for the Project at full (100 percent) occupancy and were then compared to the traffic volume projections for the Project that were presented in the February 2015 TIA. The resulting traffic volumes and the comparative analysis are presented in Table 2.



Table 2
HANOVER VINNIN SQUARE
TRIP GENERATION SUMMARY AND COMPARISON

Time Period/Direction	Vehicle Trips		
	(A) February 2019 Average Weekday Traffic Volumes Expanded to Full Occupancy ^a	(B) Full Occupancy As Presented in the February 2015 TIA	(A – B) Difference
<i>Average Weekday Daily:</i>	1,136	1,626	-490
<i>Weekday Morning Peak Hour:</i>	85	125	-40
<i>Weekday Evening Peak Hour:</i>	98	154	-56

^aObtained by multiplying the February 2019 measured average weekday traffic volumes by 1.04.

As can be seen in Table 2, based on an expansion of the measured traffic volumes for the Project at 96 percent occupancy to reflect full (100 percent) occupancy (Column A), the Project is predicted to generate approximately 1,136 vehicle trips on an average weekday (two-way, 24-hour volume) at full occupancy, with approximately 85 vehicle trips expected during the weekday morning peak-hour and 98 vehicle trips expected during the weekday evening peak-hour.

In comparison to the traffic volume projections for the Project at full occupancy that were presented in the February 2015 TIA (Column B), the Project is expected to generate 490 fewer vehicle trips (a 30 percent reduction) on an average weekday, with 40 fewer vehicle trips (a 32 percent reduction) expected during the weekday morning peak-hour and 56 fewer vehicle trips (a 36 percent reduction) during the weekday evening peak-hour. Accordingly, **it has been concluded that the fully occupied Project will generate less traffic on a daily and peak-hour basis than was predicted in the February 2015 TIA and, as such, no further remediation or mitigation is required to accommodate the Project.**

Attachments: Traffic Count Data
February 2015 Transportation Impact Assessment Trip-Generation Calculations



ATTACHMENTS

TRAFFIC COUNTS
FEBRUARY 2015 TRANSPORTATION IMPACT ASSESSMENT TRIP-GENERATION
CALCULATIONS



TRAFFIC COUNTS



Accurate Counts
978-664-2565

Location : 10 Fisher Street
Location : North of Fisher Street
City/State: Foxborough, MA

77160001

Start Time	2/2/2019 Sat	Out		Hour Totals		In		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		6	10			3	8				
12:15		0	10			2	5				
12:30		0	8			1	8				
12:45		1	10	7	38	2	6	8	27	15	65
01:00		1	10			0	8				
01:15		0	6			1	10				
01:30		0	8			2	6				
01:45		0	6	1	30	0	13	3	37	4	67
02:00		0	6			0	8				
02:15		0	8			1	8				
02:30		1	12			0	7				
02:45		1	11	2	37	1	14	2	37	4	74
03:00		1	3			0	7				
03:15		0	5			1	12				
03:30		1	23			1	6				
03:45		0	7	2	38	0	9	2	34	4	72
04:00		0	14			0	10				
04:15		0	4			0	8				
04:30		1	2			0	8				
04:45		0	11	1	31	0	11	0	37	1	68
05:00		0	4			0	10				
05:15		4	5			2	8				
05:30		1	7			0	8				
05:45		2	11	7	27	1	12	3	38	10	65
06:00		4	5			0	9				
06:15		4	8			1	11				
06:30		2	8			3	13				
06:45		2	9	12	30	0	6	4	39	16	69
07:00		3	3			1	12				
07:15		5	8			1	15				
07:30		2	1			2	6				
07:45		6	3	16	15	1	5	5	38	21	53
08:00		6	4			3	4				
08:15		5	1			2	4				
08:30		10	0			4	5				
08:45		9	4	30	9	2	8	11	21	41	30
09:00		8	3			5	7				
09:15		5	2			2	5				
09:30		15	6			5	6				
09:45		7	2	35	13	9	2	21	20	56	33
10:00		5	4			9	5				
10:15		12	4			8	4				
10:30		15	1			8	10				
10:45		8	4	40	13	11	4	36	23	76	36
11:00		14	3			8	3				
11:15		8	0			7	3				
11:30		9	3			6	4				
11:45		10	1	41	7	4	2	25	12	66	19
Total		194	288			120	363			314	651
Percent		40.2%	59.8%			24.8%	75.2%			32.5%	67.5%

Accurate Counts
978-664-2565

Location : 10 Fisher Street
Location : North of Fisher Street
City/State: Foxborough, MA

77160001

Start Time	2/3/2019		Out		Hour Totals		In		Hour Totals		Combined Totals	
	Sun	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	
12:00		1	6			3	7					
12:15		0	10			4	11					
12:30		1	7			2	8					
12:45		0	11	2	34	1	5	10	31	12	65	
01:00		1	11			0	6					
01:15		1	6			1	10					
01:30		1	15			1	8					
01:45		0	6	3	38	1	10	3	34	6	72	
02:00		1	12			1	5					
02:15		0	12			0	11					
02:30		0	8			2	4					
02:45		0	9	1	41	0	11	3	31	4	72	
03:00		0	7			0	10					
03:15		0	8			1	8					
03:30		0	8			0	7					
03:45		0	9	0	32	0	7	1	32	1	64	
04:00		0	5			0	12					
04:15		1	8			0	14					
04:30		1	5			1	8					
04:45		0	10	2	28	0	12	1	46	3	74	
05:00		0	8			1	15					
05:15		1	14			0	14					
05:30		0	12			1	12					
05:45		2	6	3	40	2	14	4	55	7	95	
06:00		2	5			0	10					
06:15		0	6			0	9					
06:30		2	5			0	8					
06:45		2	1	6	17	1	4	1	31	7	48	
07:00		1	1			1	0					
07:15		4	2			2	5					
07:30		4	1			0	2					
07:45		3	1	12	5	4	2	7	9	19	14	
08:00		5	8			3	2					
08:15		6	4			1	4					
08:30		11	3			3	3					
08:45		1	0	23	15	4	3	11	12	34	27	
09:00		5	0			0	8					
09:15		5	0			2	1					
09:30		11	0			3	0					
09:45		6	0	27	0	3	2	8	11	35	11	
10:00		8	2			3	2					
10:15		8	8			7	4					
10:30		14	4			5	10					
10:45		6	2	36	16	8	8	23	24	59	40	
11:00		9	4			7	12					
11:15		8	4			5	8					
11:30		10	0			9	4					
11:45		10	1	37	9	8	2	29	26	66	35	
Total		152	275			101	342			253	617	
Percent		35.6%	64.4%			22.8%	77.2%			29.1%	70.9%	

Accurate Counts
978-664-2565

Location : 10 Fisher Street
Location : North of Fisher Street
City/State: Foxborough, MA

77160001

Start Time	2/4/2019 Mon	Out		Hour Totals		In		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		3	5			3	5				
12:15		0	4			4	2				
12:30		0	6			0	4				
12:45		0	8	3	23	0	11	7	22	10	45
01:00		0	10			0	3				
01:15		0	8			1	5				
01:30		0	8			0	7				
01:45		1	17	1	43	1	6	2	21	3	64
02:00		0	10			0	8				
02:15		0	8			0	8				
02:30		3	6			0	4				
02:45		0	6	3	30	0	10	0	30	3	60
03:00		0	7			0	12				
03:15		0	11			0	14				
03:30		0	4			0	16				
03:45		1	12	1	34	0	10	0	52	1	86
04:00		0	5			0	10				
04:15		1	11			0	11				
04:30		2	8			1	18				
04:45		0	4	3	28	0	9	1	48	4	76
05:00		6	10			1	12				
05:15		4	9			0	12				
05:30		4	2			0	19				
05:45		4	4	18	25	2	23	3	66	21	91
06:00		9	8			3	17				
06:15		18	7			3	15				
06:30		6	5			1	15				
06:45		10	0	43	20	3	12	10	59	53	79
07:00		14	4			1	11				
07:15		10	8			4	16				
07:30		17	2			4	8				
07:45		10	1	51	15	6	10	15	45	66	60
08:00		14	5			1	5				
08:15		10	3			4	10				
08:30		17	0			4	9				
08:45		6	3	47	11	8	6	17	30	64	41
09:00		7	4			0	8				
09:15		12	3			5	3				
09:30		7	0			3	3				
09:45		8	3	34	10	2	6	10	20	44	30
10:00		5	3			6	4				
10:15		8	1			3	2				
10:30		5	2			3	3				
10:45		3	0	21	6	6	0	18	9	39	15
11:00		5	1			0	1				
11:15		6	0			8	1				
11:30		9	0			7	1				
11:45		5	0	25	1	3	2	18	5	43	6
Total		250	246			101	407			351	653
Percent		50.4%	49.6%			19.9%	80.1%			35.0%	65.0%

Location : 10 Fisher Street
Location : North of Fisher Street
City/State: Foxborough, MA

77160001

Start Time	2/5/2019 Tue	Out		Hour Totals		In		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	6			0	6				
12:15		0	8			0	7				
12:30		2	5			3	5				
12:45		0	11	2	30	1	7	4	25	6	55
01:00		0	6			0	9				
01:15		2	9			0	4				
01:30		0	10			0	10				
01:45		1	6	3	31	1	4	1	27	4	58
02:00		0	8			0	8				
02:15		1	11			1	11				
02:30		0	12			0	12				
02:45		2	9	3	40	2	11	3	42	6	82
03:00		0	7			1	14				
03:15		0	9			0	13				
03:30		0	13			1	15				
03:45		0	5	0	34	0	9	2	51	2	85
04:00		0	10			0	11				
04:15		0	5			0	10				
04:30		0	9			0	8				
04:45		0	11	0	35	1	10	1	39	1	74
05:00		4	8			0	22				
05:15		4	6			1	12				
05:30		1	4			0	15				
05:45		4	4	13	22	1	17	2	66	15	88
06:00		6	6			0	20				
06:15		20	8			0	16				
06:30		10	8			1	21				
06:45		8	9	44	31	1	7	2	64	46	95
07:00		17	6			0	10				
07:15		18	5			3	11				
07:30		18	3			7	10				
07:45		18	5	71	19	5	22	15	53	86	72
08:00		11	4			3	6				
08:15		17	4			8	6				
08:30		18	7			2	10				
08:45		16	1	62	16	6	12	19	34	81	50
09:00		9	5			6	5				
09:15		10	2			5	7				
09:30		4	3			4	8				
09:45		9	1	32	11	4	4	19	24	51	35
10:00		6	4			5	5				
10:15		8	2			2	3				
10:30		3	2			2	6				
10:45		5	3	22	11	3	2	12	16	34	27
11:00		4	1			5	2				
11:15		8	1			9	4				
11:30		7	0			5	1				
11:45		5	1	24	3	8	4	27	11	51	14
Total		276	283			107	452			383	735
Percent		49.4%	50.6%			19.1%	80.9%			34.3%	65.7%

Location : 10 Fisher Street
Location : North of Fisher Street
City/State: Foxborough, MA

77160001

Start Time	2/6/2019 Wed	Out		Hour Totals		In		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	5			3	11				
12:15		0	6			0	4				
12:30		2	10			2	4				
12:45		0	6	2	27	0	5	5	24	7	51
01:00		0	10			1	3				
01:15		1	8			1	9				
01:30		0	8			0	5				
01:45		1	9	2	35	0	4	2	21	4	56
02:00		0	6			0	10				
02:15		1	7			1	6				
02:30		0	8			0	10				
02:45		0	8	1	29	0	4	1	30	2	59
03:00		0	4			3	10				
03:15		1	8			1	15				
03:30		0	6			0	9				
03:45		1	5	2	23	0	7	4	41	6	64
04:00		1	7			1	13				
04:15		0	6			0	13				
04:30		1	11			1	11				
04:45		1	9	3	33	0	18	2	55	5	88
05:00		4	9			0	16				
05:15		6	4			0	22				
05:30		3	11			2	12				
05:45		9	10	22	34	0	18	2	68	24	102
06:00		11	8			0	17				
06:15		20	10			0	12				
06:30		6	4			1	19				
06:45		11	6	48	28	6	13	7	61	55	89
07:00		17	2			2	15				
07:15		15	4			4	8				
07:30		14	4			6	13				
07:45		19	4	65	14	2	12	14	48	79	62
08:00		18	5			3	12				
08:15		9	4			7	8				
08:30		21	1			4	7				
08:45		12	8	60	18	8	11	22	38	82	56
09:00		9	3			4	9				
09:15		6	1			7	8				
09:30		10	1			4	4				
09:45		3	1	28	6	4	5	19	26	47	32
10:00		7	5			7	3				
10:15		6	6			3	5				
10:30		3	0			3	1				
10:45		4	1	20	12	4	3	17	12	37	24
11:00		8	0			4	1				
11:15		6	2			10	0				
11:30		12	2			13	3				
11:45		6	0	32	4	2	0	29	4	61	8
Total		285	263			124	428			409	691
Percent		52.0%	48.0%			22.5%	77.5%			37.2%	62.8%

Location : 10 Fisher Street
Location : North of Fisher Street
City/State: Foxborough, MA

77160001

Start Time	2/7/2019 Thu	Out		Hour Totals		In		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	8			4	5				
12:15		1	8			2	7				
12:30		0	7			0	4				
12:45		1	3	2	26	1	7	7	23	9	49
01:00		0	4			0	7				
01:15		0	4			0	9				
01:30		0	7			1	4				
01:45		0	8	0	23	0	10	1	30	1	53
02:00		0	3			1	12				
02:15		0	10			0	9				
02:30		0	8			0	6				
02:45		1	9	1	30	0	7	1	34	2	64
03:00		0	8			1	10				
03:15		2	7			2	8				
03:30		0	4			0	7				
03:45		0	6	2	25	0	6	3	31	5	56
04:00		0	11			0	13				
04:15		0	7			0	19				
04:30		0	6			0	17				
04:45		3	6	3	30	0	12	0	61	3	91
05:00		4	6			1	9				
05:15		2	12			2	14				
05:30		6	6			0	14				
05:45		8	6	20	30	0	13	3	50	23	80
06:00		10	16			1	13				
06:15		14	6			1	19				
06:30		10	8			1	13				
06:45		7	5	41	35	3	15	6	60	47	95
07:00		16	3			2	11				
07:15		15	8			5	8				
07:30		15	2			2	20				
07:45		17	3	63	16	0	9	9	48	72	64
08:00		19	3			11	13				
08:15		6	6			6	5				
08:30		13	1			5	8				
08:45		14	2	52	12	5	8	27	34	79	46
09:00		9	1			6	8				
09:15		12	1			7	6				
09:30		12	1			3	9				
09:45		5	4	38	7	2	8	18	31	56	38
10:00		6	7			3	8				
10:15		6	3			3	2				
10:30		4	2			3	3				
10:45		7	0	23	12	4	8	13	21	36	33
11:00		7	0			5	1				
11:15		6	0			3	1				
11:30		8	1			8	2				
11:45		8	0	29	1	2	2	18	6	47	7
Total		274	247			106	429			380	676
Percent		52.6%	47.4%			19.8%	80.2%			36.0%	64.0%

Accurate Counts
978-664-2565

77160001

Location : 10 Fisher Street
Location : North of Fisher Street
City/State: Foxborough, MA

Start Time	1/28/2019		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In
12:00 AM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4	9
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	3
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	2
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	2
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	0
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	5	4
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	9	2
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	14	6
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26	11
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	31	14
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	38	30
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	39	27
12:00 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	36	29
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	34	36
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	34	34
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	39	34
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	35	33
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	30	42
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	34	46
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	24	35
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	10	24
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	12	16
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	6	16
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	14	24
Lane	0	0	0	0	0	0	0	0	0	0	482	483	427	443	455	464
Day	0	0	0	0	0	0	0	0	0	0	965	870	870	919	919	919
AM Peak	-	-	-	-	-	-	-	-	-	-	11:00	11:00	11:00	11:00	11:00	10:00
Vol.	-	-	-	-	-	-	-	-	-	-	41	37	37	29	39	30
PM Peak	-	-	-	-	-	-	-	-	-	-	12:00	14:00	14:00	17:00	14:00	17:00
Vol.	-	-	-	-	-	-	-	-	-	-	38	39	41	55	39	46

FEBRUARY 2015 TRANSPORTATION IMPACT ASSESSMENT TRIP-GENERATION
CALCULATIONS



TRANSPORTATION IMPACT ASSESSMENT

DOMAIN FOXBOROUGH
FOXBOROUGH, MASSACHUSETTS

Prepared for:

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No-Build Traffic Volumes

The 2022 No-Build condition peak-hour traffic-volumes were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2014 Existing peak-hour traffic volumes and then superimposing the peak-hour traffic volumes associated with the identified specific development projects by others. The resulting 2022 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figures 6 and 7, respectively.

PROJECT-GENERATED TRAFFIC

Design year (2022 Build) traffic volumes for the study area roadways were determined by estimating Project-generated traffic volumes and assigning those volumes on the study roadways. The following sections describe the methodology used to develop the anticipated traffic characteristics of the Project.

As proposed, the Project will entail the construction of a 248-unit residential apartment community. In order to develop the traffic characteristics of the Project, trip-generation statistics published by the ITE¹¹ for a similar land use as that proposed were used. ITE Land Use Code (LUC) 220, *Apartment*, with the independent variable of number of dwelling units equal to 248, was used to develop the traffic characteristics of the Project. Table 5 summarizes the anticipated traffic characteristics of the Project.

Table 5
TRIP GENERATION SUMMARY

Time Period/Direction	Vehicle Trips
	Proposed Apartment Community (248 Units) ^a
<i>Average Weekday Daily:</i>	
Entering	813
<u>Exiting</u>	<u>813</u>
Total	1,626
<i>Weekday Morning Peak Hour:</i>	
Entering	25
<u>Exiting</u>	<u>100</u>
Total	125
<i>Weekday Evening Peak Hour:</i>	
Entering	100
<u>Exiting</u>	<u>54</u>
Total	154

^aBased on ITE LUC 220, *Apartment*.

¹¹Ibid 4.