



Memorandum

To: Mr. Michael Boujoulian
Alliance Residential Company
184 High Street
Suite 401
Boston, MA 02110

Date: October 28, 2016

Project #: 13554.00

From: Robert L Nagi, PE
Principal

Re: Broadstone Bare Cove Park, Hingham, Massachusetts

VHB previously prepared a full traffic impact and access study¹ associated with the development of a 200-unit apartment building to be located at 230 Beal Street in Hingham, Massachusetts. The project, known as "Broadstone Bare Cove Park", is being proposed under the Commonwealth of Massachusetts' Comprehensive Permit process, commonly referred to as Chapter 40B.

This technical memorandum has been prepared as a supplement to the traffic impact and access study and documents a minor increase in project size from 200 units to 220 units in the development. This change in units is within the minor increase threshold (10%) allowed by Chapter 40B, and is not expected to create any significant additional traffic generation or additional impacts along the local roadway system beyond those already considered.

The following presents the minor traffic generation increase and provides a qualitative assessment of the additional trips on the surrounding roadway network. The general finding of this memorandum is that the additional traffic will not noticeably impact the traffic operations in the vicinity of the project development beyond what was previously presented as part of the 200-unit program.

TRIP GENERATION CHANGES

As part of the evaluation, VHB considered the potential trip generation changes associated with the increase. Using information and procedures outlined in Trip Generation², VHB compared the 200 unit development with the 220 unit project. Table 1 on the next page outlines the differences for informational purposes.

As Table 1 indicates, there is a nominal increase in the trip generation associated with the 20 unit increase. The morning and evening peak hours will see an approximate 10 trip increase and the Saturday midday peak will see about a 5 vehicle increase in traffic generation.

¹ *Traffic Impact and Access Study, Alliance Residential, 230 Beal Street, Hingham MA*, prepared by VHB for Alliance Residential Company, October 2016.

² *Trip Generation, 9th Edition*, Institute of Transportation Engineers, Washington DC, 2013.

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770

Table 1 ~ Trip Generation Comparison

	Apartments (200 Units) ^a	Apartments (220 Units) ^a	Difference
Daily (vpd)	1,340	1,455	+115
Morning Peak Hour (vph)			
in	20	20	0
<u>Out</u>	<u>80</u>	<u>90</u>	<u>+10</u>
Total	100	110	+10
Evening Peak Hour (vph)			
In	85	90	+5
<u>Out</u>	<u>45</u>	<u>50</u>	<u>+5</u>
Total	130	140	+10
Saturday			
Midday Peak (vph)			
In	50	55	+5
<u>Out</u>	<u>50</u>	<u>50</u>	<u>0</u>
Total	100	105	+5

^a Institute of Transportation Engineers, Trip Generation, 9th Edition. Land Use Code 220 [Apartments] 200 units and 220 units; regression equations for weekday, AM and PM peak hours. Due to a lack of information on Saturday Trip Generation for apartments, entering and exiting volumes for Saturday conditions is based on ITE Land Use Code 230 [residential condominium/townhome].

Note: Data is rounded to the nearest 5 trips.

Vpd – vehicles per day; vph – vehicles per hour.

VEHICULAR IMPACTS

Given the information provided in Table 1, the actual traffic increases to the roadway network are expected to be minimal throughout and along the public roadway network. Using the traffic distribution outlined in Table 5 of the full traffic impact and access study, the distribution of the additional traffic onto the roadway network will result in the following impacts to the surrounding roadway network, shown in Table 2 on the next page.

Table 2 ~ Trip Impacts Along Adjacent Roadways

Distribution	Percentage^a	Hourly Trip Increase
Lincoln Street/Route 3A (heading east)	25%	2-3 additional trips
Lincoln Street/Route 3A (heading west)	55%	5-6 additional trips
<u>Beal Street (heading south)</u>	<u>20%</u>	<u>2-2 additional trips</u>

a based on percentages in Table 5 (Trip Distribution) of the October 2016 traffic impact study for the project.

Given the volume of traffic using these streets, this volume of additional trips is well within the hourly fluctuation of traffic along these corridors and will not, in our opinion, have a tangible impact on the overall traffic operations of any of these intersections or corridors.

In fact, as part of a prior submission that has since been withdrawn (the 300 unit proposal), there are only limited changes to level of service at many of the same intersections. The only tangible changes between the prior (300 unit) development and the current (200 unit) development is the shift in travel patterns associated with the driveway restriction of allowing only right-turns out of the site.

CONCLUSION

Based on the minimal level of additional traffic generated by the shift from 200 to 220 units at the site (approximately 5-10 additional peak hour trips) and an even smaller impact on the surrounding roadways as traffic dissipates onto the network, it would appear that this adjustment to 220 units will not have much impact on surrounding roadway and intersection operations.

In reviewing these impacts, we have no additional recommendations for the project that haven't already been noted in the October 2016 Traffic Study for the 200 unit Project.

ITE TRIP GENERATION WORKSHEET
(9th Edition, Updated 2012)

LANDUSE: Apartment
LANDUSE CODE: 220

Independent Variable --- Number of Units

JOB NAME: S&S MV
JOB NUMBER: 72451

Peak Hour Traffic on Adjacent Street: 220 units

WEEKDAY

RATES:	# Studies	R ²	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	88	0.87	6.65	1.27	12.50	210	0	1,000	50%	50%
AM PEAK (ADJACENT ST)	78	0.83	0.51	0.10	1.02	235	0	1,100	20%	80%
PM PEAK (ADJACENT ST)	90	0.77	0.62	0.10	1.64	233	0	1,100	65%	35%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,463	732	732	1457	728	728
AM PEAK (ADJACENT ST)	112	22	90	112	22	89
PM PEAK (ADJACENT ST)	136	89	48	139	90	49

SATURDAY

RATES:	# Studies	R ²	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	15	0.85	6.39	2.84	8.40	175	65	360	50%	50%
PEAK OF GENERATOR	14	0.56	0.52	0.26	1.05	178	65	360	Peak Distribution Not Available	

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,406	703	703	1471	735	735
PEAK OF GENERATOR	114	NA	NA	109	NA	NA

SUNDAY

RATES:	# Studies	R ²	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	14	0.82	5.86	3.21	7.53	182	90	360	50%	50%
PEAK OF GENERATOR	13	--	0.51	0.26	1.43	186	90	360	Peak Distribution Not Available	

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,289	703	703	1311	656	656
PEAK OF GENERATOR	112	NA	NA	NA	NA	NA

ITE TRIP GENERATION WORKSHEET
(9th Edition, Updated 2012)

LANDUSE: Apartment
LANDUSE CODE: 220

Independent Variable --- Number of Units

JOB NAME: S&S MV
JOB NUMBER: 72451

Peak Hour Traffic on Adjacent Street: 200 units

WEEKDAY

RATES:	# Studies	R ²	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	88	0.87	6.65	1.27	12.50	210	0	1,000	50%	50%
AM PEAK (ADJACENT ST)	78	0.83	0.51	0.10	1.02	235	0	1,100	20%	80%
PM PEAK (ADJACENT ST)	90	0.77	0.62	0.10	1.64	233	0	1,100	65%	35%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,330	665	665	1336	668	668
AM PEAK (ADJACENT ST)	102	20	82	102	20	81
PM PEAK (ADJACENT ST)	124	81	43	128	83	45

SATURDAY

RATES:	# Studies	R ²	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	15	0.85	6.39	2.84	8.40	175	65	360	50%	50%
PEAK OF GENERATOR	14	0.56	0.52	0.26	1.05	178	65	360	Peak Distribution Not Available	

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,278	639	639	1314	657	657
PEAK OF GENERATOR	104	NA	NA	101	NA	NA

SUNDAY

RATES:	# Studies	R ²	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	14	0.82	5.86	3.21	7.53	182	90	360	50%	50%
PEAK OF GENERATOR	13	--	0.51	0.26	1.43	186	90	360	Peak Distribution Not Available	

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,172	639	639	1183	591	591
PEAK OF GENERATOR	102	NA	NA	NA	NA	NA