MEMORANDUM

TO:	Mr. John Tedeschi John Tedeschi Custom Homes 17 Northey Farm Road Scituate, MA 02066	**FROM:**	Scott W. Thornton, P.E. *and* Derek Roach, P.E. Vanasse & Associates, Inc. 35 New England Business Center Drive Suite 140 Andover, MA 01810 (978) 474-8800
DATE:	July 22, 2022	**RE:**	9417
SUBJECT:	Traffic Assessment 61 New Driftway Scituate, Massachusetts		

PROJECT DESCRIPTION

Vanasse & Associates, Inc. (VAI) has prepared this Traffic Assessment to identify traffic impacts associated with a proposed mixed-use development to be located at 61 New Driftway in Scituate, Massachusetts (the "Project"). The purpose of this assessment is to determine the Project trip generation, review the analysis of the intersection of New Driftway at Old Driftway/private driveway conducted for other area developments, and determine the Project impact to the surround infrastructure.

TRIP GENERATION

The Project entails constructing 25 multifamily residential units and 4,200 square feet (sf) of commercial space. In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)[1] for Land Use Code (LUC) 221, *Multifamily Housing (Mid-Rise) Close to Rail Transit* and LUC 822, *Strip Retail Plaza (<40K)* were used.

It should be noted that mode split data for the census tract the site is located in indicates that approximately nine percent of residents commute using public transit. Due to the site's proximity to the Greenbush MBTA station, it is expected that a higher percentage of residents would commute using transit. However, adjustments to vehicle trip generation were not included in the trip estimates. A summary of the expected vehicle-trip generation is provided in Table 1.

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[1]*Trip Generation,* 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

Table 1
PROJECT TRIP-GENERATION SUMMARY[a]

Time Period/ Directional Distribution	Residential Trips[a]	Commercial Trips	Total Trips
Weekday Daily	118	228	346
Weekday Morning Peak Hour:			
Entering	2	6	8
Exiting	6	4	10
Total	8	10	18
Weekday Evening Peak Hour:			
Entering	4	14	18
Exiting	3	14	17
Total	7	28	35
Saturday Daily	114	228	342
Saturday Midday Peak Hour:			
Entering	2	14	16
Exiting	8	14	22
Total	10	28	38

[a]Based on ITE LUC 221, *Multifamily Housing (Mid-Rise) Close to Rail Transit;* 25 units.
[b]Based on ITE LUC 822, *Strip Retail Plaza (<40K);* 4,200 sf.

As can be seen in Table 1, the Project is expected to generate 346 vehicle trips on an average weekday (two-way, 24-hour volume), with 18 vehicle trips (8 entering and 10 exiting) expected during the weekday morning peak hour. During the weekday evening peak hour, the Project is expected to generate 35 vehicle trips (18 entering and 17 exiting). On Saturday, the Project is expected to generate 342 vehicle trips with 38 vehicle trips (16 entering and 22 exiting) expected during the Saturday midday peak hour.

SPECIFIC DEVELOPMENT BY OTHERS

The Town of Scituate was contacted in order to determine if there are any planned or approved development in the area. Based on these discussions, the following projects were identified:

- *Greenbush Station Parking Lot Redevelopment* – This project entails the construction of 10,580 sf of retail/commercial uses and 78 residential units.

- *48-52 New Driftway* – This project entails construction of a gas station with four gas pumps/eight fueling positions, an approximately 4,000 sf convenience store, and an approximately 1,500 sf retail/restaurant space.

A TIAS[2] conducted by VHB and dated July 21, 2020, evaluated the operation at the intersection of New Driftway at Old Driftway/private driveway. The results of their capacity analysis are summarized in Table 2, which indicates the intersection will continue to operate at an overall level-of-service (LOS) B or better under all conditions.

Based on the analysis conducted by VHB presented in Table 2, the intersection operates at an acceptable level of service (typically LOS D or better is considered acceptable for peak-hour conditions) and would be anticipated to continue to operate at acceptable levels with the addition of the Project site traffic. The Project is expected to generate at most 38 vehicle trips during the peak hours which equates to one additional vehicle trip every 1-2 minutes. The addition of one vehicle trip every 1 to 2 minutes to the intersection will have a negligible impact on operations.

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[2]*Traffic Impact and Access Study – Mixed Use Development Scituate, Massachusetts*; Vanasse Hangen Brustlin, Inc.; July 31, 2018, revised January 16, 2019.

Table 2

NEW DRIFTWAY AT OLD DRIFTWAY LEVEL-OF-SERVICE SUMMARY – from VHB Memorandum on Mixed-Use Development, dated July 31, 2018 and revised January 16, 2019

Signalized Intersection/Peak Hour/Movement	2020 Existing				2027 No-Build				2027 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th	V/C	Delay	LOS	Queue Avg/95th	V/C	Delay	LOS	Queue Avg/95th
New Driftway at Old Driftway/Private Driveway:												
Weekday Evening:												
New Driftway EB LT	0.13	7	A	7/44	0.17	6	A	10/56	0.18	6	A	10/58
New Driftway EB TH/RT	0.44	9	A	67/307	0.41	8	A	74/333	0.42	8	A	76/341
New Driftway WB LT/TH/RT	0.58	18	B	105/327	0.52	16	B	108/360	0.52	16	B	112/373
Private Driveway NB LT/TH/RT	0.22	27	C	13/42	0.17	27	C	9/46	0.17	28	C	10/47
Old Driftway SB LT/TH	0.33	31	C	22/54	0.24	30	C	16/65	0.25	31	C	16/66
Old Driftway SB RT	0.33	5	A	0/0	0.32	6	A	0/46	0.34	6	A	0/47
Overall	--	**13**	**B**	--	--	**11**	**B**	--	--	**11**	**B**	--
Saturday Midday Peak hour:												
New Driftway EB LT	0.11	7	A	5/37	0.17	7	A	8/50	0.19	7	A	9/55
New Driftway EB TH/RT	0.46	9	A	82/381	0.52	10	A	99/462	0.53	10	A	101/471
New Driftway WB LT/TH/RT	0.56	18	B	151/553	0.66	20	B	168/623	0.67	20	C	177/651
Private Driveway NB LT/TH/RT	0.09	1	A	0/0	0.02	0	A	0/0	0.02	0	A	0/0
Old Driftway SB LT/TH	0.40	36	D	30/78	0.39	37	D	28/88	0.39	37	D	28/88
Old Driftway SB RT	0.16	7	A	0/24	0.19	7	A	0/35	0.21	6	A	0/37
Overall	--	**14**	**B**	--	--	**15**	**B**	--	--	**15**	**B**	--

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level of service.
[d]Queue length in feet.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

CONCLUSIONS

VAI has prepared this Traffic Assessment in order to determine the Project trip generation, review the analysis of the intersection of New Driftway at Old Driftway/private driveway conducted for other area developments, and determine the project impact to the surrounding infrastructure. Based on the results of this study, the following can be concluded:

- The Project is expected to generate 346 vehicle trips on an average weekday (two-way, 24-hour volume), with 18 vehicle trips (8 entering and 10 exiting) expected during the weekday morning peak hour. During the weekday evening peak hour, the Project is expected to generate 35 vehicle trips (18 entering and 17 exiting). On Saturday, the Project is expected to generate 342 vehicle trips with 38 vehicle trips (16 entering and 22 exiting) expected during the Saturday midday peak hour.

- The intersection of New Driftway at Old Driftway/private driveway was shown to operate at an overall intersection LOS B or better during the weekday morning, weekday evening, and Saturday midday peak hours under all conditions evaluated in the VHB study.

- The intersection of New Driftway at Old Driftway/private driveway is anticipated to continue to operate at an acceptable level of service of LOS B or better with the Project traffic added. The Project is expected to generate at most 38 vehicle trips during the peak hours which equates to one additional vehicle trip every 1 to 2 minutes. The addition of one vehicle trip every 1 to 2 minutes to the intersection will have a negligible impact on operations.

Cc: File

Institute of Transportation Engineers (ITE)
Trip Generation, 11 th Edition
Land Use Code (LUC) 221 - Multifamily Housing (Mid-Rise) Close to R

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X):   25

AVERAGE WEEKDAY DAILY
    T = 4.74 * (X)
    T = 4.75 *   25
    T = 118.75
    T = 118.00
    T = 118   vehicle trips
      with 50% (59   vpd) entering and 50% (59   vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC
    T = 0.32 * (X)
    T = 0.32 *   25
    T = 8.00
    T = 8   vehicle trips
      with 23% (2   vph) entering and 77% (6   vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC
    T = 0.29 * (X)
    T = 0.29 *   25
    T = 7.25
    T = 7.00
    T = 7   vehicle trips
      with 61% (4   vph) entering and 39% (3   vph) exiting.

No Saturday data provided used 221 not close to rail transit

AVERAGE Saturday DAILY
    T = 4.57* (X)
    T = 4.57 *   0
    T = 114.25
    T = 114.00
    T = 114   vehicle trips
      with 50% (57   vpd) entering and 50% (57   vpd) exiting.

Saturday Midday PEAK HOUR OF ADJACENT STREET TRAFFIC
    T = 0.39 * (X)
    T = 0.39 *   0
    T = 9.75
    T = 10   vehicle trips
      with 23% (2   vph) entering and 77% (8   vph) exiting.

Institute of Transportation Engineers (ITE)
Trip Generation, 11 th Edition
Land Use Code (LUC) 822 - Strip Retail Plaza (<40K)

Average Vehicle Trips Ends vs: 1,000 Square Feet Gross Leasable Area
Independent Variable (X):   4.200

AVERAGE WEEKDAY DAILY
$T = 54.45 * X$
$T = 54.45 *$ 4.200
$T = 228.69$
$T = 228$ vehicle trips
    with 50% (114   vpd) entering and 50% (114   vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC
$T = 2.36 * (X)$
$T = 2.36 *$ 4.200
$T = 9.91$
$T = 10$ vehicle trips
    with 60% (6   vph) entering and 40% (4   vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC
$T = 6.59 * X$
$T = 6.59 *$ 4.200
$T = 27.68$
$T = 28$ vehicle trips
    with 50% (14   vph) entering and 50% (14   vph) exiting.

SATURDAY DAILY
LUC 822 Daily	54.45	LUC 822 Daily	X	X=
LUC 822 PM	6.59	LUC 822 PM	6.57	

$T = 54.28 * X$
$T = 54.28$ 4.200
$T = 227.98$
$T = 228$ vehicle trips
    with 50% (114   vph) entering and 50% (114   vph) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR
$T = 6.57 * X$
$T = 6.57 *$ 4.200
$T = 27.59$
$T = 28$ vehicle trips
    with 51% (14   vph) entering and 49% (14   vph) exiting.

COMMUTING CHARACTERISTICS BY SEX

	Census Tract 5052.01, Plymouth County, Massachusetts	
	Total	
Label	**Estimate**	**Margin of Error**
⌄ Workers 16 years and over	1,080	±228
⌄ MEANS OF TRANSPORTATION TO WORK		
⌄ Car, truck, or van	82.4%	±9.6
Drove alone	71.5%	±9.5
⌄ Carpooled	10.9%	±7.3
In 2-person carpool	10.9%	±7.3
In 3-person carpool	0.0%	±3.6
In 4-or-more person carpool	0.0%	±3.6
Workers per car, truck, or van	1.07	±0.05
Public transportation (excluding taxicab)	8.6%	±7.6
Walked	3.0%	±3.5
Bicycle	1.2%	±2.1
Taxicab, motorcycle, or other means	0.0%	±3.6
Worked from home	4.8%	±4.6
⌄ PLACE OF WORK		
⌄ Worked in state of residence	100.0%	±3.6
Worked in county of residence	44.4%	±12.1
Worked outside county of residence	55.6%	±12.1
Worked outside state of residence	0.0%	±3.6
⌄ Living in a place	43.0%	±17.0
Worked in place of residence	7.2%	±6.8
Worked outside place of residence	35.7%	±18.9
Not living in a place	57.0%	±17.0
⌄ Living in 12 selected states	100.0%	±3.6
Worked in minor civil division of residence	14.8%	±8.9
Worked outside minor civil division of residence	85.2%	±8.9
Not living in 12 selected states	0.0%	±3.6
⌄ Workers 16 years and over who did not work from home	1,028	±230
⌄ TIME OF DEPARTURE TO GO TO WORK		
12:00 a.m. to 4:59 a.m.	9.9%	±8.3
5:00 a.m. to 5:29 a.m.	5.4%	±5.9
5:30 a.m. to 5:59 a.m.	3.5%	±5.4
6:00 a.m. to 6:29 a.m.	23.2%	±8.3
6:30 a.m. to 6:59 a.m.	6.8%	±7.1
7:00 a.m. to 7:29 a.m.	12.0%	±8.2
7:30 a.m. to 7:59 a.m.	16.4%	±9.5
8:00 a.m. to 8:29 a.m.	3.5%	±4.2
8:30 a.m. to 8:59 a.m.	6.5%	±6.9

Table Notes

COMMUTING CHARACTERISTICS BY SEX

Survey/Program: American Community Survey
Year: 2020
Estimates: 5-Year
Table ID: S0801

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, for 2020, the 2020 Census provides the official counts of the population and housing units for the nation, states, counties, cities, and towns. For 2016 to 2019, the Population Estimates Program provides estimates of the population for the nation, states, counties, cities, and towns and intercensal housing unit estimates for the nation, states, and counties.

Source: U.S. Census Bureau, 2016-2020 American Community Survey 5-Year Estimates

When information is missing or inconsistent, the Census Bureau logically assigns an acceptable value using the response to a related question or questions. If a logical assignment is not possible, data are filled using a statistical process called allocation, which uses a similar individual or household to provide a donor value. The "Allocated" section is the number of respondents who received an allocated value for a particular subject.

2019 ACS data products include updates to several categories of the existing means of transportation question. For more information, see: Change to Means of Transportation.

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see ACS Technical Documentation). The effect of nonsampling error is not represented in these tables.

The 12 selected states are Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Wisconsin.

Workers include members of the Armed Forces and civilians who were at work last week.

The 2016-2020 American Community Survey (ACS) data generally reflect the September 2018 Office of Management and Budget (OMB) delineations of metropolitan and micropolitan statistical areas. In certain instances, the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB delineation lists due to differences in the effective dates of the geographic entities.

Estimates of urban and rural populations, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Explanation of Symbols:
-
The estimate could not be computed because there were an insufficient number of sample observations. For a ratio of medians estimate, one or both of the median estimates falls in the lowest interval or highest interval of an open-ended distribution.
N
The estimate or margin of error cannot be displayed because there were an insufficient number of sample cases in the selected geographic area.
(X)
The estimate or margin of error is not applicable or not available.
median-
The median falls in the lowest interval of an open-ended distribution (for example "2,500-")
median+
The median falls in the highest interval of an open-ended distribution (for example "250,000+").
**
The margin of error could not be computed because there were an insufficient number of sample observations.
***
The margin of error could not be computed because the median falls in the lowest interval or highest interval of an open-ended distribution.
*****
A margin of error is not appropriate because the corresponding estimate is controlled to an independent population or housing estimate. Effectively, the corresponding estimate has no sampling error and the margin of error may be treated as zero.

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Technical Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.