

MEMORANDUM

Ref: 2124A

To: Scott R. Frankiewicz, LLS
New Hampshire Land Consultants, PLLC

From: Stephen G. Pernaw, P.E., PTOE

Subject: Proposed Mixed-Use Development – 2A Tactical, LLC
Barrington, New Hampshire

Date: September 13, 2021

As requested, Pernaw & Company, Inc. has conducted this “*Traffic Evaluation*” for the proposed mixed-use development located on the northeast quadrant of the NH125 (Calef Highway) / Bumford Road intersection in Barrington, New Hampshire. This study meets or exceeds the requirements of a “*Short Traffic Impact Analysis*” analysis, as specified in the Barrington Site Plan Review Regulations. Although a “*Full Traffic Impact Analysis*” could be required given the gross floor area of the proposed building (>10,000 sf), the trip generation estimates contained herein fall well below the 1,000 (daily) and 100 (peak hour) vehicle-trip guidelines for a full analysis. The purpose of this memorandum is to summarize the results of our trip generation and trip distribution analysis, as well as our research of available traffic count data and sight distance evaluation. To summarize:

Proposed Development – According to the plan entitled “*Site Layout Plan*” prepared by N. H. Land Consultants (see Attachment 1), the proposed development involves the construction of one two-story commercial building (6,000 sf) that will be comprised of a 4,120-sf office/classroom space, 3,376-sf of warehouse area, 2,624-sf of retail and 960-sf of light industrial space for gunsmithing. Vehicular access to the site is proposed via one two-way driveway that will intersect the west side of Bumford Road approximately 125-feet east of NH125, and a right-turn exit-only driveway located at the north end of the site on NH125.

Also proposed, at the rear of the site is a 3,572-sf concrete pad with the capacity for eight storage trailers. Access to the concrete pad is proposed via a 10-foot-wide paved access from Bumford Road and an internal gravel access from the rear area of the proposed building. The storage trailers will be used for the storage of pallets and accessories.

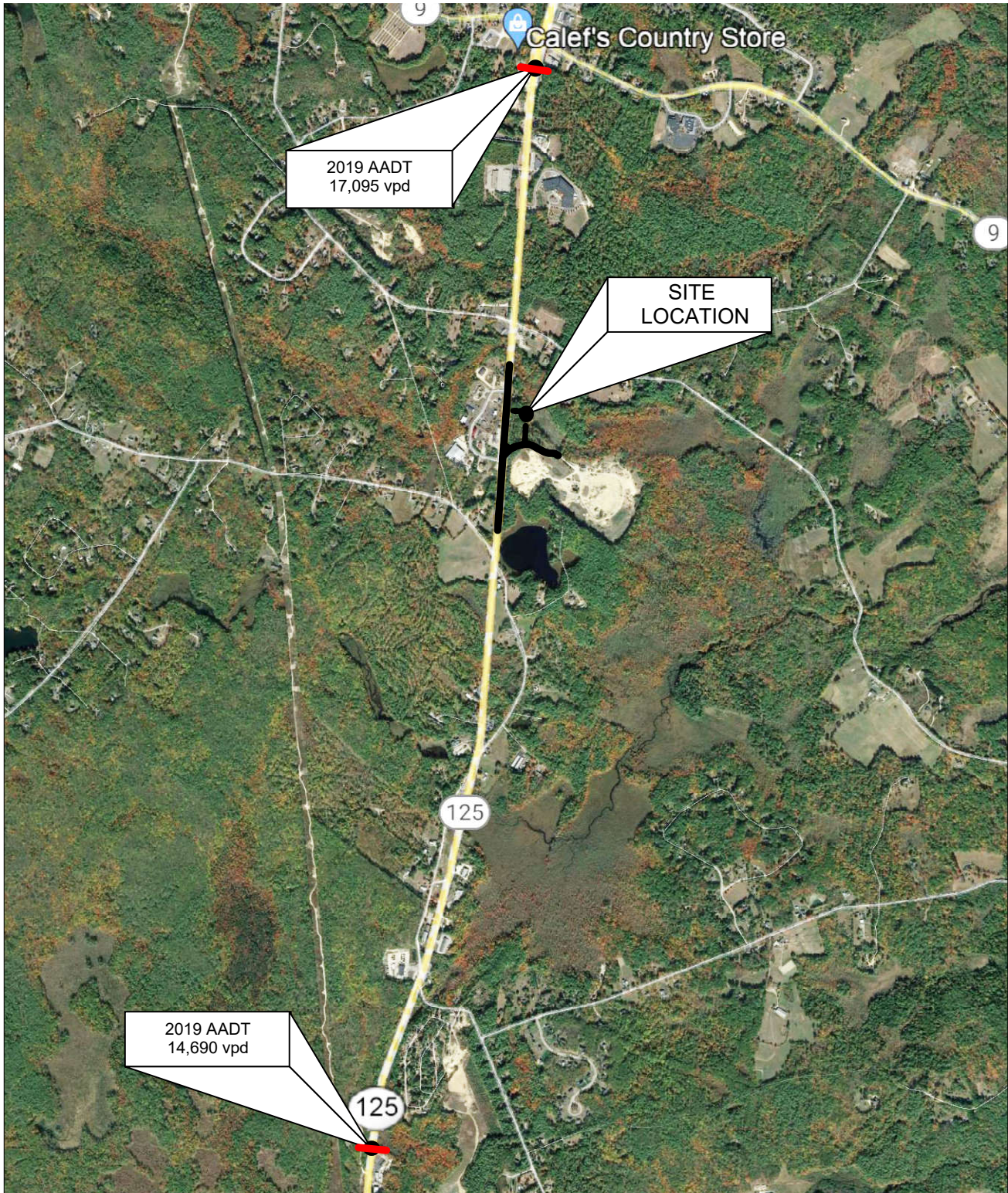
The proposed building will be open Monday through Thursday-(9:00 AM to 7:30 PM) and Friday and Saturday-(9:00 AM to 8:30 PM). Employees will be available for the sale of small firearms, ammunition and firearm repair services and accessories. Monthly gun safety courses will also be provided on Sunday from 10:00 AM to 4:00 PM with a maximum enrollment of ten people. The business will be closed during the gun safety courses.



Figure 1 shows the location of the subject site with respect to the area roadway system, and it also shows the location of the nearby NHDOT short-term automatic traffic recorder count stations on NH125.

Existing Conditions – NH125 is a state-maintained two-lane principal arterial highway with a north-south orientation in the study area. The pavement width is delineated with a four-inch double yellow centerline and four-inch single white edge lines and has paved shoulders on both sides of the highway. The speed limit is posted at 50 mph in each direction in this area. NH125 exhibits a slight downgrade of less than one-percent in the northbound direction.

Existing Traffic Volumes – Research at the NHDOT revealed that there are two short-term Automatic Traffic Recorder count stations located on NH125: 1) approximately 1.1 miles to the north (south of NH9) and, 2) approximately 2.1 miles to the south (north of Pinkham Road). According to the NHDOT reports, the section of NH125 north of the site carried an Annual Average Daily Traffic (AADT) volume of approximately 17,095 vehicles per day (vpd) in 2019, up slightly from 16,892 vpd in 2018. The section south of the site carried AADT volumes of approximately 14,690 vpd in 2019, up slightly from 14,626 vpd in 2018 (see Attachments 2 - 5). Interesting to note, the more recent traffic count data collected in July 2020 clearly shows the impact of the Covid-19 pandemic is waning.

This data demonstrates that weekday traffic volumes in the area typically reach peak levels from 7:00 to 8:00 AM and from 3:00 to 4:00 or 4:00 to 5:00 PM on NH125, thus corresponding to the typical commuter periods. The diagrams on Page 3 summarize the daily and hourly variations in traffic demand along NH125, north and south of the subject site.



-  = AUTOMATIC TRAFFIC RECORDER LOCATION (NHDOT)
-  = INTERSECTION TURNING MOVEMENT COUNT LOCATION

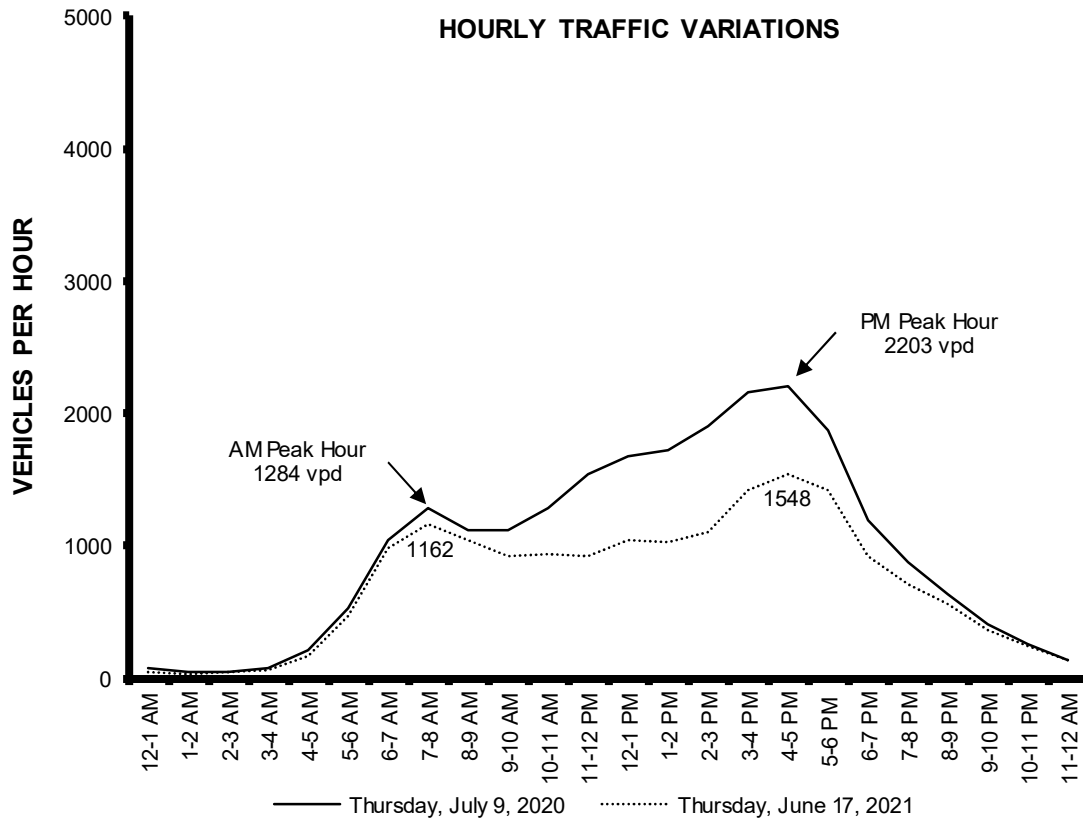
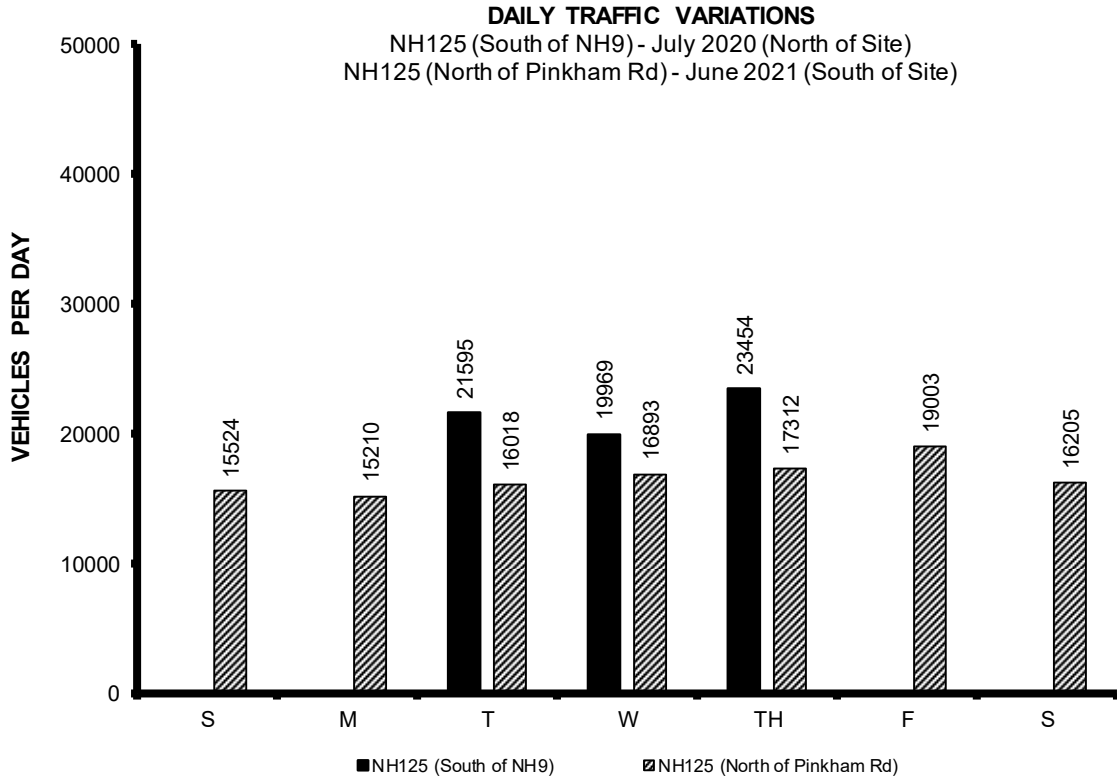


2124A

Figure 1

Site Location

Traffic Evaluation, Proposed Mixed-Use Development, Barrington, New Hampshire



Trip Generation - To estimate the quantity of vehicle-trips that will be generated by the proposed commercial building, Pernaw & Company, Inc. considered several standard trip generation rates and equations published by the Institute of Transportation Engineers (ITE)¹. Land Use Code 820 (Shopping Center), LUC 150 (Warehousing), LUC 715 (Single Tenant Office Building) and LUC 110 (General Light Industrial) are considered to be reasonable land use categories for each individual use in preparing Estimate A. The Estimate B trips were derived using the trip rates for LUC 861 (Sporting Goods Superstore). The gross floor area (square footage) was used as the independent variable in these cases.

The trip generation analysis is summarized on Table 1 and shows that the proposed mixed-use development is expected to generate approximately 11 vehicle-trips (9 arrivals, 2 departures) during the weekday AM peak hour period, and approximately 22 vehicle-trips (11 arrivals, 11 departures) during the PM peak hour period, on an average weekday basis (see Attachment 6 & 7).

	Estimate A					Estimate B
	Retail ¹ (2,624 sf)	Warehouse ² (3,376 sf)	Office ³ (4,120 sf)	Gunsmith ⁴ (960 sf)	Sub Total	Sports Store ⁵ (11,080 sf)
Weekday Total (24 hrs.)						
Entering	50 veh	3 veh	23 veh	3 veh	79 trips	160 trips
Exiting	<u>50 veh</u>	<u>3 veh</u>	<u>23 veh</u>	<u>3 veh</u>	<u>79 trips</u>	<u>160 trips</u>
Total	100 trips	6 trips	46 trips	6 trips	158 trips	320 trips
AM Peak Hour						
Entering	1 veh	1 veh	6 veh	1 veh	9 trips	3 trips
Exiting	<u>1 veh</u>	<u>0 veh</u>	<u>1 veh</u>	<u>0 veh</u>	<u>2 trips</u>	<u>1 trips</u>
Total	2 trips	1 trips	7 trips	1 trips	11 trips	4 trips
PM Peak Hour						
Entering	5 veh	0 veh	1 veh	0 veh	6 trips	11 trips
Exiting	<u>5 veh</u>	<u>1 veh</u>	<u>6 veh</u>	<u>1 veh</u>	<u>13 trips</u>	<u>11 trips</u>
Total	10 trips	1 trips	7 trips	1 trips	19 trips	22 trips

¹ ITE Land Use Code 820 - Shopping Center (2,624 sf) (Trip Rate Method)

² ITE Land Use Code 150 - Warehousing (3,376 sf) (Trip Rate Method)

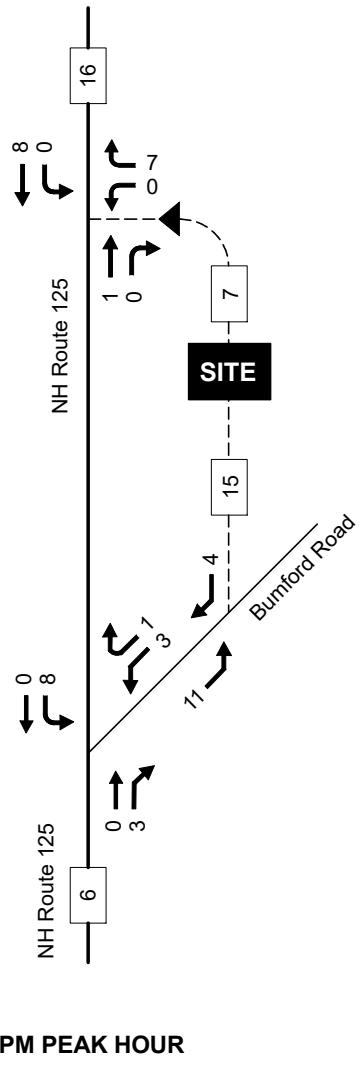
³ ITE Land Use Code 715 - Single Tenant Office Building (4,120 sf) (Trip Rate Method)

⁴ ITE Land Use Code 110 - General Light Industrial (0.960 sf) (Trip Rate Method)

⁵ ITE Land Use Code 861 - Sporting Goods Superstore (11,080 sf) (Trip Rate Method)

Trip Distribution – This analysis was based on commuting pattern data from the latest census and our local knowledge of the study area. The results indicate that the majority (approximately 70%) of site traffic will travel to/from points north on NH125 (see Attachment 8). Figure 2 shows the distribution of site traffic during the worst-case PM peak hour period.

¹ Institute of Transportation Engineers, *Trip Generation*, tenth edition (Washington, D.C., 2017).



PM PEAK HOUR

Figure 2

Site Generated Traffic Volumes - PM Peak Hour
Traffic Evaluation, Proposed Mixed-Use Development, Barrington, New Hampshire

Sight Distance – Sight distance at intersections is an important safety consideration. The operator of a vehicle approaching an intersection should have an unobstructed view of the intersection and sufficient length of roadway to enable a full stop, should it be required to avoid a collision. Similarly, exiting vehicles from a minor approach (proposed site driveway and from Bumford Road) should have sufficient visibility of approaching traffic in order to safely enter the traffic flow on to the major street (NH125).

With routine trimming/maintenance of roadside vegetation (and snowbanks) within the highway right-of-way, the required stopping sight distances for the post speed limit (50 mph = 425 feet) and a reasonable design speed (60 mph = 570 feet) are achievable given the favorable horizontal and vertical alignment features of the highway. Attachments 9 & 10 include photographs showing the driver's view from the Bumford Road and Proposed Site Driveway approaches to NH125.

Findings & Conclusions:

1. Access to the subject site is proposed via one two-way driveway that will intersect the west side of Bumford Road (approximately 125-feet east of NH125) and an exit-only driveway on the east side of NH125 (north of Bumford Road).
2. According to data collected at the NHDOT count station that is located approximately 1.1 miles north of the proposed site, this section of NH125 carried an AADT volume of approximately 17,095 vehicles per day in 2019. Another count station on NH125, located 2.1-miles to the south of the site, carried an AADT volume of 14,690 vpd in 2019. The highest hourly traffic volumes occurred from 3:00 to 4:00 or 4:00 to 5:00 PM on weekdays.
3. The trip generation analyses indicates that the proposed commercial building will generate approximately 11 vehicle-trips during the AM peak hour (9 arrivals, 2 departures) and 19 vehicle-trips during the PM peak hour (6 arrivals, 13 departures) when fully operational. These levels are well below the 100 hourly trip level for a “Full” analysis.
4. Site traffic is expected to be distributed approximately 70% to/from the north and 20% to/from the south; based on the analysis of the commuting pattern data and our local knowledge of the study area.
5. Based on the trip generation estimates contained herein, the subject driveways will function adequately with one shared departure lane on its approach to Bumford Road and NH125, and these approaches should operate under STOP sign control (MUTCD #R1-1).
6. Development sites that generate fewer than 500 vehicle-trips per day are generally considered to be “low” traffic generators. Based on the daily estimate of 156-320 vehicle-trips per day (see Table 1), the proposed mixed-use development is not considered to be a major traffic generator.
7. This section of NH125 exhibits a straight horizontal alignment and the vertical profile is essentially flat. This means that with the appropriate clearing of roadside vegetation on both sides of the proposed site driveway, the stopping sight distances requirements for the posted speed limit (50 mph), a reasonable design speed (60 mph), and the NHDOT 400-foot guideline are easily achievable.
8. This section of NH125 is under the jurisdiction of NHDOT District 6, and their approval to construct the site driveway on NH125 is required through the Driveway Permit system. The proposed site driveway on Bumford Road requires updating any Driveway Permit that was previously issued to the Town of Barrington.

Attachments



Stephen G. Pernaw 9/13/24

ATTACHMENTS



Transportation Data Management System

List View All DIRs

Record	1462	of 5744	Goto Record	go
Location ID	82027055	MPO ID		
Type	SPOT	HPMS ID		
On NHS	Yes	On HPMS	No	
LRS ID	S0000125__	LRS Loc Pt.		
SF Group	04	Route Type		
AF Group	04	Route	NH 125	
GF Group	E	Active	Yes	
Class Dist Grp	Default	Category	3	
Seas Clss Grp	Default			
WIM Group	Default			
QC Group	Default			
Funct'l Class	Other Principal Arterial	Milepost		
Located On	Calef Hwy			
Loc On Alias	NH 125 (CALEF RD) SOUTH OF NH 9			
More Detail				
STATION DATA				

Directions: ?

AADT ?

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2020	18,845	2,314	12	58	17,149 (91%)	1,696 (9%)	
2019	17,095 ³		11	58	15,658 (92%)	1,437 (8%)	Grown from 2018
2018	16,892 ³		11	58	15,575 (92%)	1,317 (8%)	Grown from 2017
2017	16,561	1,740	11	58	15,367 (93%)	1,194 (7%)	
2016	14,708 ³				13,413 (91%)	1,295 (9%)	Grown from 2015

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Travel Demand Model										
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV	

VOLUME COUNT			
Date	Int	Total	
Thu 7/9/2020	60	23,454	
Wed 7/8/2020	60	19,969	
Tue 7/7/2020	60	21,595	
Thu 5/11/2017	60	19,169	
Wed 5/10/2017	60	19,175	
Tue 5/9/2017	60	18,398	
Thu 7/10/2014	60	17,953	
Wed 7/9/2014	60	15,959	
Tue 7/8/2014	60	16,136	
Thu 6/16/2011	60	17,358	

VOLUME TREND ?	
Year	Annual Growth
2020	10%
2019	1%
2018	2%
2017	13%
2016	2%
2015	3%
2014	0%
2011	0%
2008	-2%
2005	-6%



Transportation Data Management System



Excel Version

Weekly Volume Report			
Location ID:	82027055	Type:	SPOT
Located On:	Calef Hwy	:	
Direction:	2-WAY		
Community:	BARRINGTON	Period:	Mon 7/6/2020 - Sun 7/12/2020
AADT:	18845		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM		53	60	71				61	0.3%
1:00 AM		30	51	41				41	0.2%
2:00 AM		51	41	51				48	0.2%
3:00 AM		87	71	72				77	0.4%
4:00 AM		188	180	209				192	0.9%
5:00 AM		522	532	538				531	2.4%
6:00 AM		1027	948	1038				1,004	4.6%
7:00 AM		1223	1241	1284				1,249	5.8%
8:00 AM		1072	1120	1124				1,105	5.1%
9:00 AM		1005	1063	1122				1,063	4.9%
10:00 AM		1194	1180	1279				1,218	5.6%
11:00 AM		1312	1244	1548				1,368	6.3%
12:00 PM		1439	1390	1682				1,504	6.9%
1:00 PM		1642	1525	1721				1,629	7.5%
2:00 PM		1840	1661	1910				1,804	8.3%
3:00 PM		2078	1896	2165				2,046	9.4%
4:00 PM		2314	1835	2203				2,117	9.8%
5:00 PM		1756	1359	1872				1,662	7.7%
6:00 PM		993	858	1196				1,016	4.7%
7:00 PM		639	597	880				705	3.3%
8:00 PM		508	494	639				547	2.5%
9:00 PM		301	306	411				339	1.6%
10:00 PM		182	201	255				213	1.0%
11:00 PM		139	116	143				133	0.6%
Total	0	21,595	19,969	23,454	0	0	0		
24hr Total		21595	19969	23454				21,673	
AM Pk Hr		11:00	11:00	11:00					
AM Peak		1312	1244	1548				1,368	
PM Pk Hr		4:00	3:00	4:00					
PM Peak		2314	1896	2203				2,138	
% Pk Hr		10.72%	9.49%	9.39%				9.87%	



Transportation Data Management System

List View All DIRs

Record	52	of 5744	Goto Record	go
Location ID	02255001	MPO ID		
Type	SPOT	HPMS ID		
On NHS	Yes	On HPMS	Yes	
LRS ID	S0000125__	LRS Loc Pt.		
SF Group	04	Route Type		
AF Group	04	Route	NH 125	
GF Group	E	Active	Yes	
Class Dist Grp	Default	Category	1	
Seas Clss Grp	Default			
WIM Group	Default			
QC Group	Perm			
Funct'l Class	Other Principal Arterial	Milepost		
Located On	Calef Hwy			
Loc On Alias	NH 125 (CALEF HWY) NORTH OF PINKHAM RD (SB-NB) (01255002-01255003)			
More Detail				
STATION DATA				Show Data

Directions: 2-WAY NB SB
1 1

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2020	13,252	1,414	11	59	12,057 (91%)	1,195 (9%)	
2019	14,690	1,491	10	60	13,457 (92%)	1,233 (8%)	
2018	14,626	1,507	10	57	13,485 (92%)	1,141 (8%)	
2017	14,551						
2016	14,456						

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Travel Demand Model										
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV	

VOLUME COUNT			
Date	Int	Total	
Sun 6/20/2021	60	15,524	
Sat 6/19/2021	60	16,205	
Fri 6/18/2021	60	19,003	
Thu 6/17/2021	60	17,312	
Wed 6/16/2021	60	16,893	
Tue 6/15/2021	60	16,018	
Mon 6/14/2021	60	15,210	
Sun 6/13/2021	60	15,110	
Sat 6/12/2021	60	16,422	
Fri 6/11/2021	60	17,887	

VOLUME TREND	
Year	Annual Growth
2020	-10%
2019	0%
2018	1%
2017	1%
2016	3%
2015	1%
2014	1%
2013	2%
2012	1%
2011	-2%



Transportation Data Management System



Excel Version

Weekly Volume Report			
Location ID:	02255001	Type:	SPOT
Located On:	Calef Hwy	:	
Direction:	2-WAY		
Community:	BARRINGTON	Period:	Mon 6/14/2021 - Sun 6/20/2021
AADT:			

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM	42	53	52	53	58	89	95	63	0.4%
1:00 AM	34	40	39	35	44	49	52	42	0.3%
2:00 AM	40	54	34	55	44	50	37	45	0.3%
3:00 AM	65	57	70	61	76	51	29	58	0.4%
4:00 AM	153	156	147	170	148	84	63	132	0.8%
5:00 AM	475	448	480	473	419	173	121	370	2.2%
6:00 AM	987	984	1024	991	951	351	242	790	4.8%
7:00 AM	1231	1263	1242	1162	1109	612	420	1,006	6.1%
8:00 AM	1045	1060	1061	1044	1010	812	657	956	5.8%
9:00 AM	857	800	931	917	993	1007	999	929	5.6%
10:00 AM	834	843	831	931	1022	1152	1235	978	5.9%
11:00 AM	871	907	957	923	1112	1358	1342	1,067	6.4%
12:00 PM	850	935	952	1049	1201	1302	1334	1,089	6.6%
1:00 PM	899	952	976	1028	1258	1297	1202	1,087	6.6%
2:00 PM	1046	1097	1192	1111	1378	1160	1156	1,163	7.0%
3:00 PM	1243	1260	1340	1416	1457	1161	1118	1,285	7.7%
4:00 PM	1340	1495	1500	1548	1553	1130	1130	1,385	8.3%
5:00 PM	1176	1288	1358	1424	1438	1114	1192	1,284	7.7%
6:00 PM	770	806	893	917	1129	891	998	915	5.5%
7:00 PM	410	521	665	710	883	791	814	685	4.1%
8:00 PM	327	422	466	555	629	641	573	516	3.1%
9:00 PM	231	288	357	360	501	459	373	367	2.2%
10:00 PM	171	173	187	244	409	288	222	242	1.5%
11:00 PM	113	116	139	135	181	183	120	141	0.8%
Total	15,210	16,018	16,893	17,312	19,003	16,205	15,524		
24hr Total	15210	16018	16893	17312	19003	16205	15524	16,595	
AM Pk Hr	7:00	7:00	7:00	7:00	11:00	11:00	11:00		
AM Peak	1231	1263	1242	1162	1112	1358	1342	1,244	
PM Pk Hr	4:00	4:00	4:00	4:00	4:00	12:00	12:00		
PM Peak	1340	1495	1500	1548	1553	1302	1334	1,439	
% Pk Hr	8.81%	9.33%	8.88%	8.94%	8.17%	8.38%	8.64%	8.74%	

Trip Generation Summary

Alternative: Alternative 1
 Phase:
 Project: 2124A
 Open Date: 9/10/2021
 Analysis Date: 9/10/2021

ITE	Land Use	Weekday Average Daily Trips			Weekday AM Peak Hour of Adjacent Street Traffic			Weekday PM Peak Hour of Adjacent Street Traffic		
		* Enter	Exit	Total	* Enter	Exit	Total	* Enter	Exit	Total
110	GINDUSTRIAL 1 0.96 1000 Sq. Ft. GFA	3	2	5	1	0	1	0	1	1
150	WAREHOUSE 1 3.38 1000 Sq. Ft. GFA	3	3	6	1	0	1	0	1	1
715	OFFICESINGLE 1 4.12 1000 Sq. Ft. GFA	23	23	46			0			0
820	CENTERSHOPPING 1 2.62 1000 Sq. Ft. GLA	50	49	99	1	1	2	5	5	10
861	SUPERSTORESPORTS 1 11.08 1000 Sq. Ft. GFA	160	159	319	3	1	4	11	11	22
<hr/>										
	Unadjusted Volume	239	236	475	6	2	8	16	18	34
	Internal Capture Trips	0	0	0	0	0	0	0	0	0
	Pass-By Trips	0	0	0	0	0	0	2	2	4
	Volume Added to Adjacent Streets	239	236	475	6	2	8	14	16	30

Total Weekday Average Daily Trips Internal Capture = 0 Percent
 Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent
 Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

* - Custom rate used for selected time period.

Trip Generation Summary

Alternative: Alternative 1

Phase:

Open Date: 9/10/2021

Project: 2124A

Analysis Date: 9/10/2021

ITE	Land Use	Weekday AM Peak Hour of Generator			Weekday PM Peak Hour of Generator				
		*	Enter	Exit	Total	*	Enter	Exit	Total
110	GIN INDUSTRIAL 1 0.96 1000 Sq. Ft. GFA				0				0
150	WAREHOUSE 1 3.38 1000 Sq. Ft. GFA				0				0
715	OFFICESINGLE 1 4.12 1000 Sq. Ft. GFA		6	1	7		1	6	7
820	CENTERSHOPPING 1 2.62 1000 Sq. Ft. GLA				0				0
861	SUPERSTORESPORTS 1 11.08 1000 Sq. Ft. GFA				0				0
Unadjusted Volume			6	1	7		1	6	7
Internal Capture Trips			0	0	0		0	0	0
Pass-By Trips			0	0	0		0	0	0
Volume Added to Adjacent Streets			6	1	7		1	6	7

Total Weekday AM Peak Hour of Generator Internal Capture = 0 Percent

Total Weekday PM Peak Hour of Generator Internal Capture = 0 Percent

* - Custom rate used for selected time period.



TRIP DISTRIBUTION ANALYSIS

Home Destination Report - Where Workers Live Who are Employed in the Selection Area - by County Subdivisions

	Count	Gateway %		Gateway Allocation		
		NH125 N	NH125 S	NH125 N	NH125 S	
OUTBOUND						
Barrington town (Strafford, NH)	377	0.55	0.45	207	170	377
Rochester city (Strafford, NH)	364	1.00		364	0	364
Dover city (Strafford, NH)	169	0.50	0.50	85	85	170
Farmington town (Strafford, NH)	94	1.00		94	0	94
Somersworth city (Strafford, NH)	86	1.00		86	0	86
Portsmouth city (Rockingham, NH)	65	0.50	0.50	33	33	66
Strafford town (Strafford, NH)	62	1.00		62	0	62
Lee town (Strafford, NH)	48		1.00	0	48	48
Northwood town (Rockingham, NH)	46		1.00	0	46	46
Milton town (Strafford, NH)	39	1.00		39	0	39
	1350			970	382	1352
				71.7%	28.3%	100%
				70%	30%	100%



Pernaw & Company, Inc

Looking Left



Looking Right



2124A

Pernaw & Company, Inc

Looking Left



Looking Right



2124A

Attachment

Sight Distance Photographs - NH Route 125 / Proposed Site Driveway

Traffic Evaluation, Proposed Mixed-Use Development, Barrington, New Hampshire