

August 15, 2022

Mr. Mike Michael J. Sudak, E.I.
 Attar Engineering, Inc.
 1284 State Road
 Eliot, Maine 03903

RE: PROPOSED MARIJUANA SALES SHOP – 41 ROUTE 236

As requested, this memorandum is written to document revised trip generation and updated traffic analysis for a proposed marijuana sales shop at 41 Route 236 in Kittery, Maine. The site location is shown in Figure 1. Sewall performed a full traffic impact analysis study for the originally proposed 3,150 square foot (S.F.) building, dated 12/29/2021. That analysis was based upon winter counts, which were factored to peak summer conditions. This updated analysis is based upon summer 2022 traffic counts. Additionally, the proposed building has been reduced in size from 3,150 S.F. to 1,034 S.F. The revised trip generation analysis is as follows:

TRIP GENERATION

The number of trips to be generated by the smaller marijuana sales shop was estimated utilizing the latest Institute of Transportation Engineers (ITE) “Trip Generation, 11th edition”, which is the same approach used for the original traffic impact study. Land use code (LUC) 882 – Marijuana Dispensary was utilized on the basis of 1,034 gross S.F. The results are summarized below:

<u>Time Period</u>	ITE TRIP GENERATION <u>One-Way Trip-Ends</u>
Weekday	218
AM Peak Hour – Adjacent Street	11
Entering	6
Exiting	5
AM Peak Hour – Generator	17
Entering	9
Exiting	8

<u>Time Period</u>	<u>One-Way Trip-Ends</u>
PM Peak Hour – Adjacent Street	19
Entering	9
Exiting	10
PM Peak Hour – Generator	25
Entering	12
Exiting	13
Saturday Peak Hour - Generator	30
Entering	15
Exiting	15

As seen above, the smaller shop is expected to generate from 11 to 30 one-way trips in peak hours and 218 one-way (109 round-trips) daily based upon the ITE data. This is a significant reduction from the previously proposed facility, which would have generated from 33 to 91 trips in peak hours and 666 trips on a daily basis.

TRAFFIC VOLUMES

Based upon the previous traffic counts, the highest peak hour period for Route 236 is the weekday PM peak hour, typical of most Maine locations. An updated turning movement count was conducted on August 9, 2022 under peak summer conditions at the intersection of Route 236 and the Pine Brook Business Suites. The previous counts were conducted in December of 2021 and given time of year, required significant factoring to obtain projected summer volumes. It is important to note that the actual summer 2022 counts were 15 % lower than the factored 2021 traffic volumes, which is a significant difference, showing that the volumes utilized in the original Traffic Impact Study were inflated. The updated 2022 traffic counts are summarized in Figure 2.

The new marijuana sales trips were assigned to Route 236 based upon the traffic patterns recorded during the counts, which are also consistent with the previous trip assignment patterns used in the original study. These trip assignments, for the PM peak hour analysis period, are shown in Figure 3. As in the original study, the 2022 volumes were projected to 2023 No Build conditions using a ½ % annual traffic growth rate. The projected 2023 No Build volumes are shown in Figure 4. Lastly, the projected Build volumes are shown in Figure 5.

AUXILIARY TURN LANE WARRANTS

It is understood that the Town of Kittery has requested right and left turn lanes on Route 236 to serve the proposed marijuana sales facility. Route 236 is a state facility. MaineDOT utilizes the warrant charts in NCHRP 457 to determine if auxiliary turn lanes are warranted. Sewall performed left and right turn lane analysis, for the projected Build 2023 volumes. The warrant charts are included in the appendix. The results show that neither a right turn lane or a left turn lane are warranted on Route 236 to serve traffic entering the site. Since these turn lanes are unwarranted it is unlikely that MaineDOT would allow them to be built within their right-of-way, especially given potential wetland impacts.

CAPACITY ANALYSIS

Traffic operations are evaluated in terms of level of service (LOS). Level of service is a qualitative measure that describes operations by letter designation. The levels range from A - very little delay to F - extreme delays. Level of service "D" is generally considered acceptable in urban locations while LOS "E" is generally considered the capacity of a facility and the minimum tolerable level. The level of service for unsignalized intersections is based upon average control delay per vehicle for each minor, opposed movement. These criteria are defined in the following table excerpted from the 2010 "Highway Capacity Manual":

Unsignalized Intersection Level of Service

<u>LOS</u>	<u>Delay Range</u>
A	< = 10.0 seconds
B	> 10.0 and <= 15.0
C	> 15.0 and <= 25.0
D	> 25.0 and <= 35.0
E	> 35.0 and <= 50.0
F	> 50.0

UNSIGNALIZED INTERSECTION ANALYSIS

The level of service (LOS) was calculated for the unsignalized site drive intersection for projected 2023 Build conditions using Synchro 11/SimTraffic to assure acceptable levels of service. The results, averaging five (5) runs, are summarized below:

<u>Approach</u>	Route 236 & Site Drive PM Peak Hour Level of Service <u>2023 Build</u>
Eastbound Site Drive	C (15.2)
Northbound Route 236	A (1.0)
Southbound Route 236	A (2.2)
Overall Intersection	A (1.5)

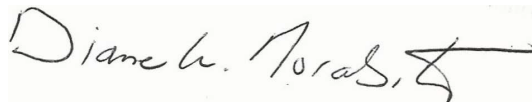
As seen above, the proposed site drive is expected to function at good level of service “C” during the PM peak hour, demonstrating no capacity concerns for the projected volumes.

To summarize, the reduced size facility is expected to generate from 11 to 30 one-way trips in peak hours, which would not be expected to have a significant impact on off-site traffic operations. Updated peak summer traffic counts were obtained for the traffic analysis, which did not identify any capacity constraints. Additionally, neither a right-turn nor a left-turn lane are warranted on Route 236 to store traffic entering the proposed marijuana sales facility.

As always, please do not hesitate to contact Sewall if you or the Town of Kittery have any questions or require any additional information or analysis regarding our findings.



Sincerely,



Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering



Figure 1

Site Location Map

41 Route 236 Marijuana Sales

Kittery, Maine





PM Peak Hour: 2:30-3:30

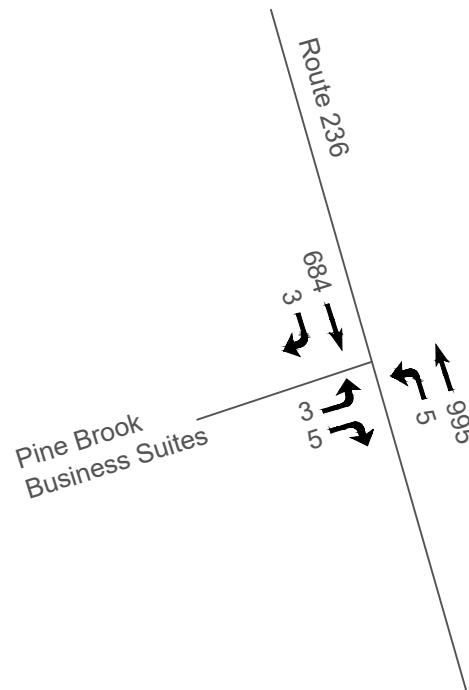


Figure 2

2022 Existing PM Peak Hour Volumes

41 Route 236 Marijuana Sales

Kittery, Maine

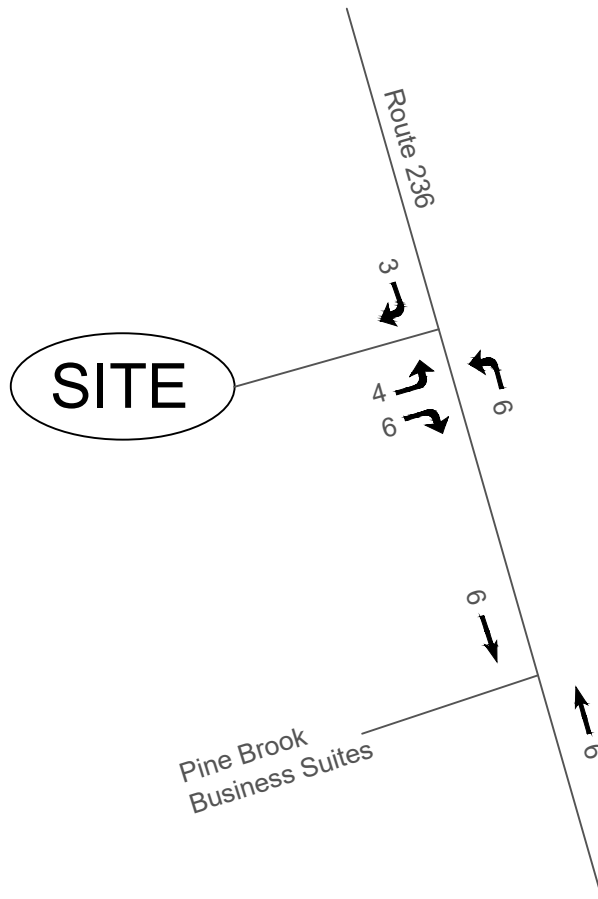




19 Primary Trips

9 In

10 Out



Signalized Intersection



Figure 3

PM Peak Hour Trip Assignments

41 Route 236 Marijuana Sales

Kittery, Maine



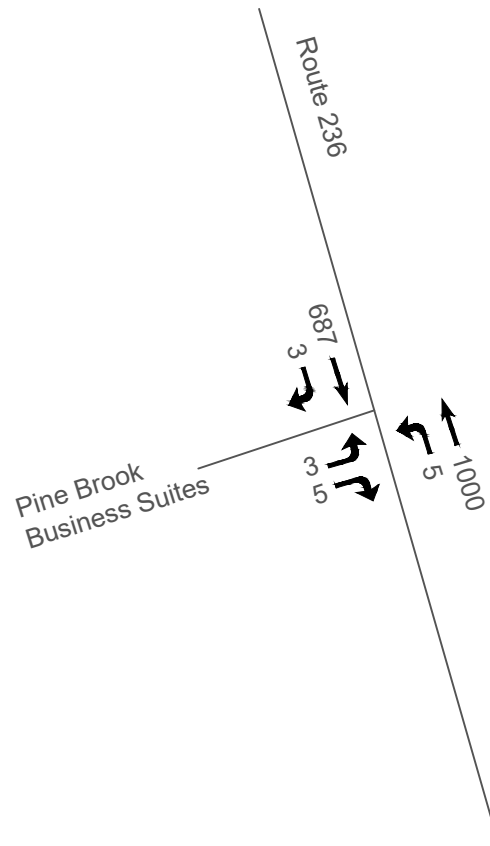


Figure 4

**2023 No Build PM Peak Hour Volumes
41 Route 236 Marijuana Sales
Kittery, Maine**



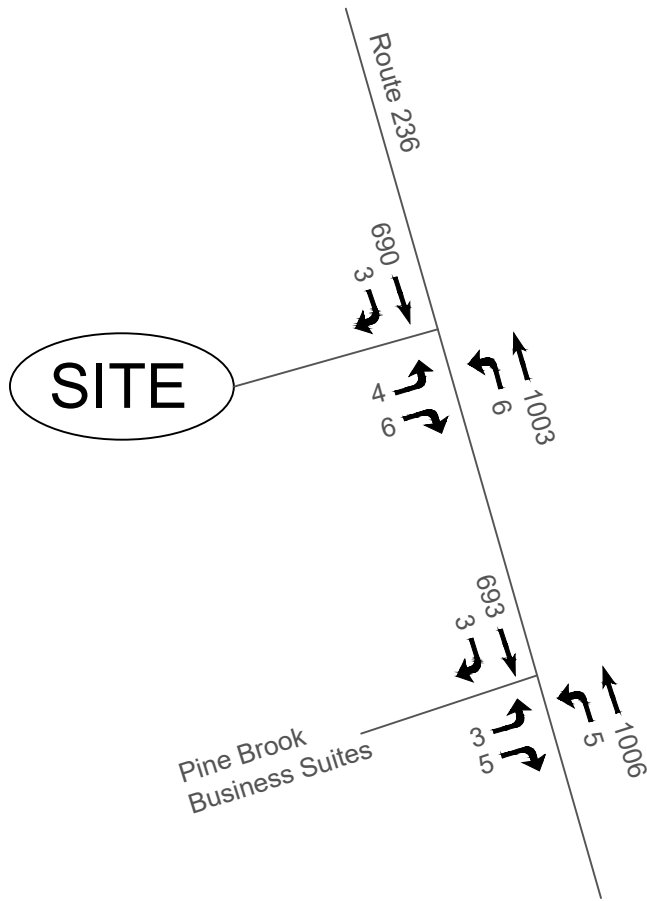


Figure 5

2023 Build PM Peak Hour Volumes

41 Route 236 Marijuana Sales

Kittery, Maine



Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

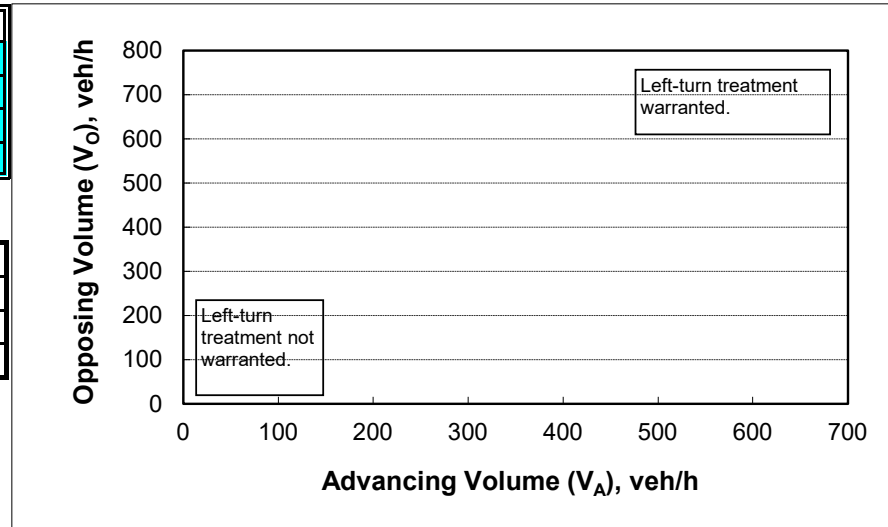
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	40
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	1009
Opposing volume (V_O), veh/h:	693

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1058
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

2023 PM - LEFT TURN LANE WARRANT NOT MET - ROUTE 236 AND SITE DRIVE

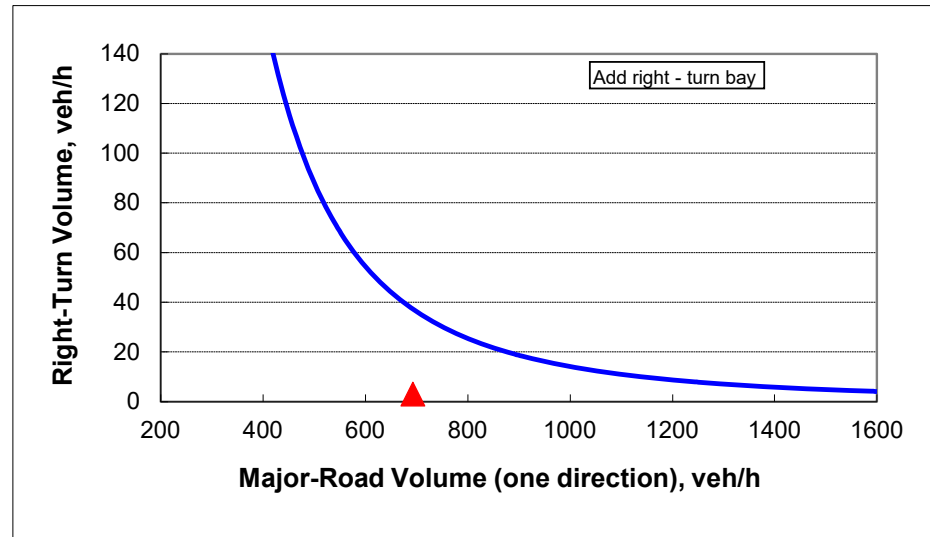
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	40
Major-road volume (one direction), veh/h:	693
Right-turn volume, veh/h:	3

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	37
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



2023 PM - RIGHT TURN LANE WARRANT NOT MET - ROUTE 236 & SITE DRIVE

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	-1:-10	-1:-10	-1:-10	-1:-10	-1:-10	-1:-10
End Time	12:00	12:00	12:00	12:00	12:00	12:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1842	1920	1885	1832	1837	1863
Vehs Exited	1851	1903	1886	1827	1844	1862
Starting Vehs	38	28	47	37	35	35
Ending Vehs	29	45	46	42	28	38
Travel Distance (mi)	912	942	931	901	910	919
Travel Time (hr)	32.8	35.8	33.2	31.8	32.8	33.3
Total Delay (hr)	9.0	11.0	8.9	8.2	9.1	9.2
Total Stops	588	726	587	573	590	612
Fuel Used (gal)	29.8	31.4	30.0	29.3	29.8	30.1

Interval #0 Information Seeding

Start Time	-1:-10
End Time	-1:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Record

Start Time	-1:00
End Time	12:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1842	1920	1885	1832	1837	1863
Vehs Exited	1851	1903	1886	1827	1844	1862
Starting Vehs	38	28	47	37	35	35
Ending Vehs	29	45	46	42	28	38
Travel Distance (mi)	912	942	931	901	910	919
Travel Time (hr)	32.8	35.8	33.2	31.8	32.8	33.3
Total Delay (hr)	9.0	11.0	8.9	8.2	9.1	9.2
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Fuel Used (gal)	29.8	31.4	30.0	29.3	29.8	30.1

3: Route 236 & Martin Road/Stevenson Road Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.7	2.1	0.1	0.8	0.5
Total Del/Veh (s)	27.2	28.4	14.0	7.8	12.6

6: Route 236 & Site Drive Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	1.0	0.0	0.6
Total Del/Veh (s)	15.2	1.0	2.2	1.5

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	16.5

Intersection: 3: Route 236 & Martin Road/Stevenson Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	L	TR	L	TR
Maximum Queue (ft)	62	42	114	74	139	466	88	245
Average Queue (ft)	21	11	36	32	18	192	36	80
95th Queue (ft)	54	35	84	68	74	374	74	183
Link Distance (ft)	642		972			879		1226
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		50		50	175		200	
Storage Blk Time (%)	4	0	9	6		8		1
Queuing Penalty (veh)	1	0	4	3		1		0

Intersection: 6: Route 236 & Site Drive

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	34	56
Average Queue (ft)	9	3
95th Queue (ft)	31	27
Link Distance (ft)	232	456
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 9

Intersection: 3: Route 236 & Martin Road/Stevenson Road

Phase	1	2	4	5	6	8
Movement(s) Served	SBL	NBT	EBTL	NBL	SBT	WBTL
Maximum Green (s)	10.0	45.0	20.0	5.0	50.0	20.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	C-Max	None	None	C-Max	None
Avg. Green (s)	7.5	71.1	8.9	6.3	82.2	8.9
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	33	5	15	71	11	15
Cycles @ Minimum (%)	0	0	3	0	0	3
Cycles Maxed Out (%)	0	95	0	0	89	0
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA
Number of Complete Cycles : 0