

## Technical Memorandum

**Date:** January 18, 2023

**To:** Bentley W. Warren III, Bentley's Campground  
Rick Licht, P.E. Licht Environmental Design, LLC

**From:** William Bray, P.E.  
Senior Traffic Engineer  
Barton & Loguidice, LLC.

**Re:** Bentley's Campground, 24 Bentley Way, Arundel, Maine

~~~~~



### Introduction

Barton and Loguidice (B&L) were retained by Bentley Warren III to develop “peak” summer trip generation projections for the existing Bentley’s Campground, located at 24 Bentley Way in the Town of Arundel. Bentley’s Campground presently operates with a total of 82 campsites, with sites reserved for Class A, B and C Recreational Vehicles, Park Models and smaller camping equipment.

Site trip generation estimates are generally prepared based upon standard trip generation rates presented in the latest edition of the Institute of Transportation Engineers “**TRIP GENERATION**” publication (MaineDOT adopted the eleventh (11<sup>th</sup>) edition in 2022, representing the most current copy of the ITE publication). The study format that follows provides site trip forecasts based upon actual “*peak*” summer traffic data and compares this rate to a trip rate projection based upon the national ITE trip publication.

B&L applied the following studies and procedures in predicting “*peak*” summer trip generation forecasts for the existing Bentley’s Campground.

- Conduct vehicle data collection studies (by vehicle classification) at Bentley’s Campground entrance.
- Summarize traffic data and determine “*peak*” hourly volumes.
- Establish the number of occupied camp sites for the survey date.
- Estimate 2022 “*peak*” summer trip rate per occupied campsite.
- Develop a comparative site trip rate per occupied campsite applying ITE trip rates.

The detail of each major study component is presented in greater detail as follows:

### **Task #1: Conduct Field Traffic Data Studies:**

Bentley's Saloon & Campground advised that Fridays are typically the peak travel day during the summer months. Historically, the Campground experiences their highest campsite occupancy levels during the month of July. Campers typically arrive for a weekend or extended stay mid-afternoon into the early evening hours on Friday. B&L, in consultation with Bentley's Saloon & Campground, selected Friday, July 15<sup>th</sup> as the study date. The traffic field survey was conducted at the existing Bentley's Campground entrance/Bentley's Saloon intersection between the hours of 12:00 p.m. and 8:00 p.m. (Refer to the image at the bottom of page for the exact location of the traffic survey). All trips entering and/or exiting the Campground were directionally recorded in 15-minute intervals between the study hours of the following nine (9) vehicle classifications:

1. Passenger Car
2. Truck (Dual Wheel Vehicle)
3. Semi-truck
4. Bus
5. Bicycle
6. Motorcycle
7. Small Campers
8. Large Campers
9. RV's

The traffic data summary report for the study intersection is attached as an appendix to the technical report.

### **Task #2: Summarize traffic data and establish peak hourly volumes for both study intersections:**

Camping trips entering and exiting the Bentleys Campground intersection at the Bentley's Saloon driveway peak between 6:30 and 7:30p.m. During the stated time period a total of **72** trips were recorded. Thirty-five (35) trips were passenger vehicle trips; (25) motorcycle trips, (2) small camper vehicle trips and 10 golf cart trips. Directionally, a total of 51 vehicles enter the Campground with 25 of the 51 trips arriving directly from U.S. Route 1 and the remaining (26) arrival trips enter the Campground turning left from the Bentley's Saloon internal driveway into the Campground. Fourteen (14) of the egressing trips turn right into the Bentley's Saloon internal driveway and the remaining (7) trips continue to the U.S. Route 1 intersection.

This report acknowledges a large portion of the vehicle trips connecting through the Bentley Saloon driveway, either entering or exiting the Campground, are internal trips generated by the close presence of the Bentley's Saloon. Campers are specifically going to or returning from Bentley's Saloon for a spell versus trips either entering or exiting through the driveway for the sole purpose of checking in at the Campground Office. This circulation pattern artificially inflates the volume of peak trips generated by the Campground.

### **Task #3: Establish Number of Occupied Campsites for Study Date:**

All Campers must check in at the Bentley's Saloon desk upon their arrival to the Campground. Bentley's Saloon Administrator advised in an email dated 10-05-2022 a total of 82 campsites were occupied on Friday, July 15, 2022. A copy of said correspondence from Bentley's Saloon is attached for reference.

#### Task #4: Estimate Campground Trip Rate for Study Date

The site trip rate per occupied campsite is a simple mathematical calculation that divides the total campsite trips recorded in the peak hour by the number of occupied campsites for the survey date, subject to one adjustment. The ten (10) golf cart trips observed during the identified peak hour must be removed from the total volume of site trips; golf carts are not licensed vehicles; therefore, they are not used to calculate site trip rates. Accordingly, Bentley's Campground generates a trip rate per occupied campsite of **0.76** or a total of **62** vehicle trips.

The trip rate calculation does not account for the internal Campground trips that patronize Bentley's Saloon; anecdotally, as stated above, a number of the Campground trips enter or exit the Bentley's Saloon driveway from the Campground to visit Bentley's Saloon.

Trip rate calculation is presented in "red" as follows:

Calculation: 72 total trips – 10 golf cart trips ÷ 82 occupied campsites = 0.76 trips/occupied campsite

#### Task #5: Comparative Site Trip Forecasts

The 11<sup>th</sup> edition of the Institute of Transportation Engineers (ITE) "TRIP GENERATION" publication provides peak hour trip rates for a campground/recreational vehicle park amongst numerous other land-uses. Specifically, Land-Use Category #416 in the noted national publication, which has been adopted by the MaineDOT and is required for all traffic site trip projections unless approved otherwise by the State agency. Land-Use Category #416 is described as follows: "A campground/recreational vehicle park is a recreational site that accommodates campers, trailers, tents, and recreational vehicles on a transient basis."

**NOTE: The ITE trip rate for a Campground/Recreational Vehicle Park during the weekday PM peak hour of the campground is representative of an average trip rate based upon field studies conducted in the states of Rhode Island, Vermont, and Washington; whereas the projected trip rate developed for Bentley's Campground is calculated based upon a single study conducted on a peak summer Friday.**

Land-Use #416 provides the following peak hour trip rates for the noted time periods:

AM Peak Hour of the Street = 0.21 trips/occupied campsite

PM Peak Hour of the Street = 0.27 trips/occupied campsite

AM Peak Hour of the Campground = 0.25 trips/occupied campsite

**PM Peak Hour of the Campground = 0.41 trips/occupied campsite**

The latter site trip rate noted for the PM Peak Hour of the Campground most directly compares with the peak time period observed for the existing Bentley's Campground site of 6:30 to 7:30 p.m. During this same time period the existing Bentley's Campground would be expected to generate about **34** vehicle trips. This per occupied site trip value, which is based upon ITE trip rate information, is roughly half the volume recorded (**62** trips) on Friday, July 15, 2022 at the Bentley's Campground.

#### Summary

1. Bentley Warren III authorized the conduct of a detailed traffic survey at Bentley's Campground during the month of July 2022. The traffic survey was conducted on Friday, July 15, 2022 between the hours of 12:00 p.m. and 8:00 p.m. All traffic entering/exiting the Campground was recorded in 15-minute intervals and classified by vehicle type for the full duration of the study.

2. Bentley's Saloon Administrator provided information showing a total of **82** campsites were occupied during the Friday, July 15, 2022 traffic survey date.
3. The traffic data was summarized to determine the peak hour travel period of the Campground. A total of 72 trips were recorded between 6:30 and 7:30 p.m., which represents the peak hour of the Campground. Directionally, a total of 51 trips entered the Campground and 21 trips exited. Thirty-five (35) of the total peak hour trips were passenger vehicles, 25 of the total trips were motorcycle trips, there were 2 small camper trips and the remaining vehicles observed in the peak hour were 10 golf cart trips.
4. Thirty-two (32) of the total site trips generated during the noted peak hour time period either entered or exited the Campground directly to/from U.S. Route 1. The remaining (40) site trips measured in the peak hour of 6:30 to 7:30 p.m., either enter or exit from the secondary Bentley's Saloon driveway.

The 10 golf cart trips recorded in the measured peak hour are deleted from the trip rate calculations because they are not legally authorized vehicles on the public highways.

5. Bentley's Campground generated a total of **62** vehicle trips during the established peak hour of the site. The division of the **62** site trips by the number of occupied campsites, provides a per occupied campsite trip rate of **0.76** trips per campsite.
6. It is evident that a number of the total 31 vehicle trips (40 trip minus 9 golf cart trips = 31 trips) connecting to or from the Bentley's Saloon driveway and the Campground have an origin or destination to Bentley's Saloon. This conclusion can only be confirmed with the performance of a very detailed interview survey, which was not conducted as part of this traffic study.
7. The 11<sup>th</sup> edition of the Institute of Transportation Engineers (ITE) "**TRIP GENERATION**" handbook predicts a Campground/Recreational vehicle park can be expected to generate 0.41 trips per campsite during an average evening peak hour of the campground. This same trip rate was applied in the performance of the Eaton Traffic Engineering Traffic Impact Study dated June, 2010. Additionally, the Maine Department of Transportation Traffic Movement Permit issued to Bentley's Saloon, LLC on March 14, 2011 was also based upon the same trip rate presented in the ITE document.

The Reader is cautioned that the field data collected on July 15, 2022 is a single point of data collected on a peak summer day versus the national trip rate information obtained through (ITE), which represents an **average trip rate** based upon field studies conducted in the States of Rhode Island, Vermont, and Washington.

8. The 2010 Eaton Traffic Engineering study was performed based upon the noted trip rate of 0.41 trips per occupied site and a total of 270 campsites resulting in a total 124 trip occurring in the evening peak hour of the site.
9. The proposed Campground as permitted by MaineDOT on March 14, 2011 approves a total of 190 trips for full build-out of the Campground. Overall, the site is operating well within the Campground's MaineDOT Permit trip values.
10. Barton and Longuidice, recommends site trip generation should continue being monitored as subsequent Campground phases are developed. Future studies should consider multiple survey dates for shorter durations and perhaps a spot survey to quantify the percentage of trips generated by Bentley's Saloon.

## William J. Bray

---

**From:** rick licht <rlicht@securespeed.net>  
**Sent:** Wednesday, October 5, 2022 7:53 AM  
**To:** trafficsolutions@maine.rr.com  
**Cc:** 'Andy Kaski'  
**Subject:** FW: July 15 weekend occupancy

Bill:

See below for the traffic update

Rick

---

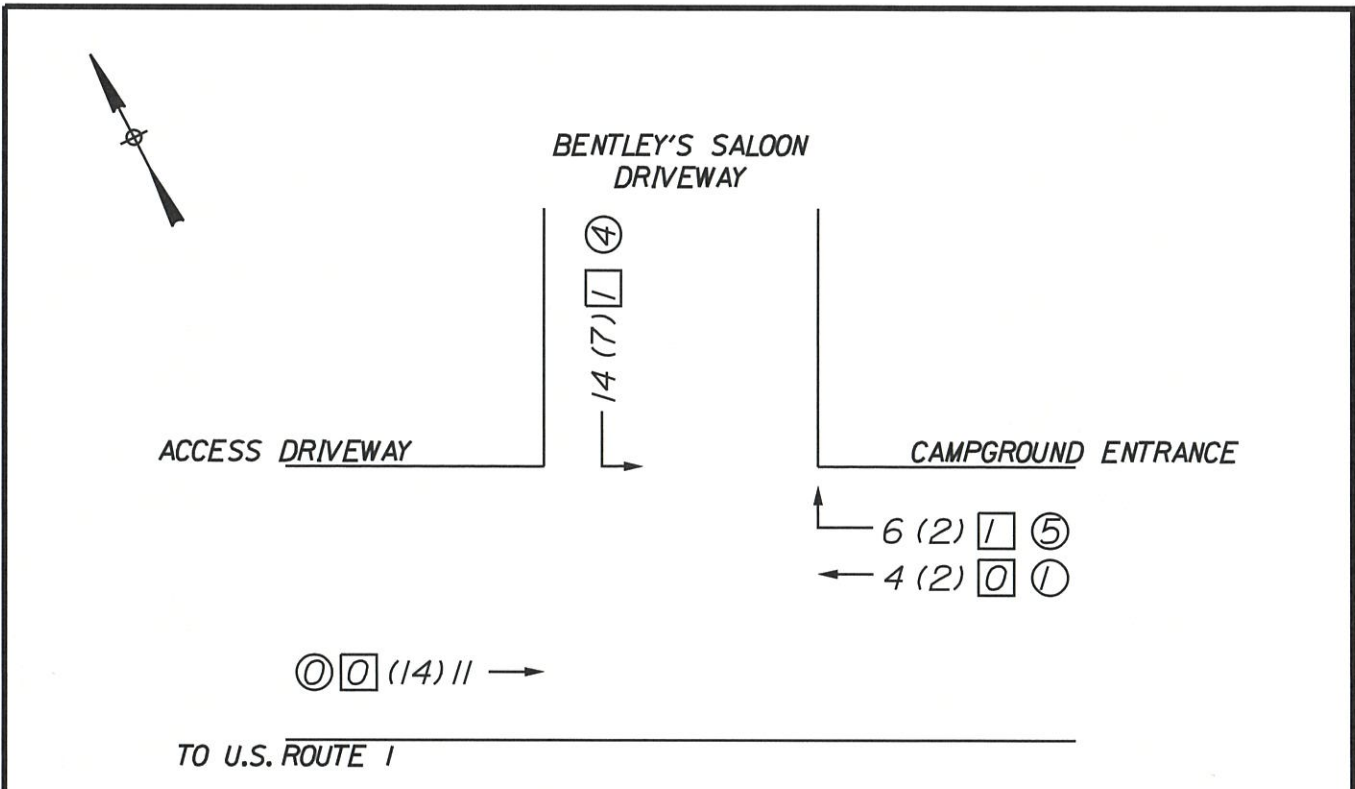
**From:** Lisa Zatalava [mailto:info@bentleyssaloon.com]  
**Sent:** Wednesday, October 5, 2022 7:47 AM  
**To:** rick licht  
**Cc:** Bentley Warren  
**Subject:** July 15 weekend occupancy

good morning rick,

the occupancy at the campground for july 15, 2022 weekend was 82 campsites.

thank you.

*Lisa Zatalava, Managing Partner  
Bentley's Saloon & Campground  
1601 Portland Road  
Arundel, ME 04046  
207-985-8966  
207-985-8968 (fax)*



LEGEND

- XX = PASSENGER CAR
- (XX) = MOTORCYCLE
- ☒ = SMALL CAMPER
- ⊗ = GOLF CART

**FIGURE 1**  
**BENTLEY'S CAMPGROUND**  
**PEAK HOUR SITE TRIPS**  
**(JULY 15, 2022)**

# Traffic Solutions

17 Mount View Dr  
Gorham, ME 04038

Arundel Bentley's Lot & Campground File Name : Arundel Bentleys Internal Lot & Campground 7-15-22  
 July 15, 2022 Site Code : 00715221  
 Sunny Start Date : 7/15/2022  
 Count by Dillon Douglass Page No : 1

Groups Printed- Passenger Car - Truck - Semi - Bus - Bicycle - Motorcycle - Small Camper - Large Camper - RV's - Golf Carts

| Start Time | Internal Lot<br>From North |      |            | Campground<br>From East |      |            | Campground<br>From West |      |            | Int. Total |
|------------|----------------------------|------|------------|-------------------------|------|------------|-------------------------|------|------------|------------|
|            | Right                      | Left | App. Total | Right                   | Thru | App. Total | Thru                    | Left | App. Total |            |
| 12:00 PM   | 0                          | 0    | 0          | 1                       | 1    | 2          | 2                       | 0    | 2          | 4          |
| 12:15 PM   | 0                          | 1    | 1          | 2                       | 4    | 6          | 2                       | 2    | 4          | 11         |
| 12:30 PM   | 2                          | 5    | 7          | 2                       | 0    | 2          | 2                       | 0    | 2          | 11         |
| 12:45 PM   | 3                          | 5    | 8          | 2                       | 1    | 3          | 2                       | 0    | 2          | 13         |
| Total      | 5                          | 11   | 16         | 7                       | 6    | 13         | 8                       | 2    | 10         | 39         |
| 01:00 PM   | 1                          | 4    | 5          | 1                       | 2    | 3          | 1                       | 0    | 1          | 9          |
| 01:15 PM   | 3                          | 11   | 14         | 6                       | 2    | 8          | 5                       | 0    | 5          | 27         |
| 01:30 PM   | 2                          | 4    | 6          | 2                       | 1    | 3          | 8                       | 0    | 8          | 17         |
| 01:45 PM   | 0                          | 6    | 6          | 2                       | 0    | 2          | 4                       | 0    | 4          | 12         |
| Total      | 6                          | 25   | 31         | 11                      | 5    | 16         | 18                      | 0    | 18         | 65         |
| 02:00 PM   | 0                          | 2    | 2          | 6                       | 1    | 7          | 1                       | 0    | 1          | 10         |
| 02:15 PM   | 2                          | 5    | 7          | 8                       | 3    | 11         | 7                       | 1    | 8          | 26         |
| 02:30 PM   | 4                          | 8    | 12         | 4                       | 5    | 9          | 12                      | 0    | 12         | 33         |
| 02:45 PM   | 2                          | 2    | 4          | 2                       | 3    | 5          | 5                       | 0    | 5          | 14         |
| Total      | 8                          | 17   | 25         | 20                      | 12   | 32         | 25                      | 1    | 26         | 83         |
| 03:00 PM   | 2                          | 3    | 5          | 1                       | 1    | 2          | 3                       | 0    | 3          | 10         |
| 03:15 PM   | 2                          | 1    | 3          | 0                       | 0    | 0          | 3                       | 3    | 6          | 9          |
| 03:30 PM   | 5                          | 6    | 11         | 3                       | 1    | 4          | 3                       | 1    | 4          | 19         |
| 03:45 PM   | 5                          | 7    | 12         | 2                       | 5    | 7          | 6                       | 2    | 8          | 27         |
| Total      | 14                         | 17   | 31         | 6                       | 7    | 13         | 15                      | 6    | 21         | 65         |
| 04:00 PM   | 3                          | 5    | 8          | 1                       | 4    | 5          | 2                       | 1    | 3          | 16         |
| 04:15 PM   | 2                          | 3    | 5          | 1                       | 0    | 1          | 10                      | 4    | 14         | 20         |
| 04:30 PM   | 5                          | 7    | 12         | 3                       | 4    | 7          | 5                       | 1    | 6          | 25         |
| 04:45 PM   | 1                          | 4    | 5          | 2                       | 4    | 6          | 5                       | 1    | 6          | 17         |
| Total      | 11                         | 19   | 30         | 7                       | 12   | 19         | 22                      | 7    | 29         | 78         |
| 05:00 PM   | 2                          | 4    | 6          | 2                       | 3    | 5          | 1                       | 0    | 1          | 12         |
| 05:15 PM   | 0                          | 6    | 6          | 3                       | 1    | 4          | 1                       | 1    | 2          | 12         |
| 05:30 PM   | 1                          | 3    | 4          | 0                       | 3    | 3          | 5                       | 0    | 5          | 12         |
| 05:45 PM   | 2                          | 6    | 8          | 1                       | 0    | 1          | 9                       | 2    | 11         | 20         |
| Total      | 5                          | 19   | 24         | 6                       | 7    | 13         | 16                      | 3    | 19         | 56         |
| 06:00 PM   | 2                          | 4    | 6          | 0                       | 1    | 1          | 4                       | 0    | 4          | 11         |
| 06:15 PM   | 3                          | 1    | 4          | 1                       | 2    | 3          | 3                       | 0    | 3          | 10         |
| 06:30 PM   | 4                          | 7    | 11         | 4                       | 4    | 8          | 15                      | 1    | 16         | 35         |
| 06:45 PM   | 3                          | 10   | 13         | 5                       | 2    | 7          | 3                       | 0    | 3          | 23         |
| Total      | 12                         | 22   | 34         | 10                      | 9    | 19         | 25                      | 1    | 26         | 79         |
| 07:00 PM   | 3                          | 7    | 10         | 2                       | 0    | 2          | 6                       | 1    | 7          | 19         |
| 07:15 PM   | 5                          | 2    | 7          | 3                       | 1    | 4          | 1                       | 2    | 3          | 14         |
| 07:30 PM   | 9                          | 5    | 14         | 2                       | 5    | 7          | 4                       | 1    | 5          | 26         |
| 07:45 PM   | 6                          | 3    | 9          | 3                       | 3    | 6          | 1                       | 0    | 1          | 16         |
| Total      | 23                         | 17   | 40         | 10                      | 9    | 19         | 12                      | 4    | 16         | 75         |