



Monitoring Visitor Capacity: Acadia National Park Carriage Roads, 2003

Crowding and Behaviors



Carriage at Little Long Pond. Acadia National Park Archives. No Date

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Executive Summary

Carriage roads were monitored for crowding and problem behaviors in 2003 using established methods.

Crowding. Estimations of carriage road use levels indicate that the crowding standard was not violated. The 3,000 persons-per-day limit was not exceeded, based on a one-tailed 80% confidence level. The highest estimated use was 2,247. Visitor use on the top ten busiest days of July and August was similar to previous years. The number of days with visitor use greater than 2,000 per day was comparable to 1997-1999 but higher than 2000-2002, even with 8 days of data loss during early August.

Behaviors. In 2003 we corrected our statistical analysis from past years regarding behaviors, and report here a summary of the monitoring results from 1997, 2000, and 2003. Behavior standards were violated for the *Dog Off Leash* behavior every year and in each zone (six times). Behavior standards for the *Startle* behavior were violated twice in the Low Use Zone (1997 and 2000). Behavior standards for the *Obstruction* behavior were violated every year (three times) in the High Use Zone.

Demographic results for the questionnaire are consistent with previous research and monitoring. Residents are more often walking than biking, staying less time than other visitors, and entering at times and places when it is less busy. Compared with the 1997 monitoring sample, the 2000 and 2003 samples have greater representation from residents, walkers, and equestrians. Less than 5% of carriage road visitors are using the Island Explorer to reach the carriage roads.

Recommendations. We recommend one more monitoring period, now scheduled for 2006, before reevaluating these violations and the standards established for these four behaviors and deciding what course of action, beyond the education efforts listed below, is needed. Four years of data is still not enough for determining a trend, but it should suffice for this reevaluation.

Encouraging large groups to break into smaller groups of ten or less people is still strongly recommended as a general measure to mitigate crowding as expressed through PPVs. Based on a complaint letter received in 2003 regarding the “obstructing the road” behavior, we recommend reinvigorating our education efforts regarding this and all behaviors. Just as Leave No Trace is a part of staff training, so should be a review of carriage road courtesy guidelines. All staff should be strongly encouraged to offer brief reminders to “violators” at every opportunity, especially for obstructing the road.

Enforcement and education of visitors regarding dogs should be re-emphasized again also; all staff should make an effort to contact visitors with dogs off leash (and dogs on leash to offer thanks). The sign committee should consider added signs for dogs off leash as was suggested in public comments on the hiking trails plan. The dog on leash symbol is lost somewhat in the trailhead exhibits.

Education must be a sustained program to achieve behavior standards.

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INTRODUCTION

Park managers established a carrying capacity for the Acadia National Park carriage road system in early 1997 after three years of research and application of the Visitor Experience Resource Protection (VERP) process (see Manning 1996, Manning 1998a, Manning 1998b, and Jacobi 1997a). This carrying capacity was based on indicators and standards for a quality experience as outlined in VERP (National Park Service 1997). Crowding (number of people) and four problem behaviors were selected as indicators for a high quality carriage road experience. For 1997-2002 monitoring results, see Jacobi (1997b), Jacobi (1998), Jacobi (2000), Jacobi (2001) Jacobi (2002), and Jacobi (2003a). Monitoring data from 1995 are in park files.

From the VERP process, park managers decided to manage for a diversity of carriage road experiences based on existing use levels and patterns. To provide this diversity, the carriage road system was divided into two zones defined by geography and time.

The High Use Zone defined the heavy visitor use areas and times on the carriage roads. It consisted of the carriage road segments connecting intersections 1-10 and 14-17 (Figure 1). This zone covers the Paradise Hill, Witch Hole Pond, Eagle Lake, Jordan Pond, and Bubble Pond areas. Temporally, the High Use Zone included only the hours between 10:00 a.m. and 5:00 p.m., and only the days between June 20 and Labor Day, plus two days each of the Memorial and Columbus Day weekends. All three conditions (location, time of day, and time of year) must occur together for the High Use Zone.

The Low Use Zone defined the lesser-used areas and times on the carriage roads, and consisted of all locations and times other than those of the High Use Zone.

The same indicators for crowding and problem behaviors were used for both zones, but different standards were established. Crowding and behavior standards are described below. A full account of the establishment of standards can be found in Jacobi (1997a).

CROWDING STANDARDS

Some background information is needed to understand the crowding standard. A typical viewscape on the carriage roads is about 100 meters, and this is also the likely limit of the effective viewscape. At 100 meters, people are far away and probably don't influence a sense of crowding. The number of persons seen per viewscape (PPV) at any moment was a concept developed through the research to measure crowding. In the research and in the establishment of standards, PPVs were grouped into ranges of 0, 1-5, 6-10, 11-15, 16-20, and 21-30, and expressed per unit of time. Thus, the number of minutes per hour visitors see 1-5 PPV, for example, is a measure of crowding.

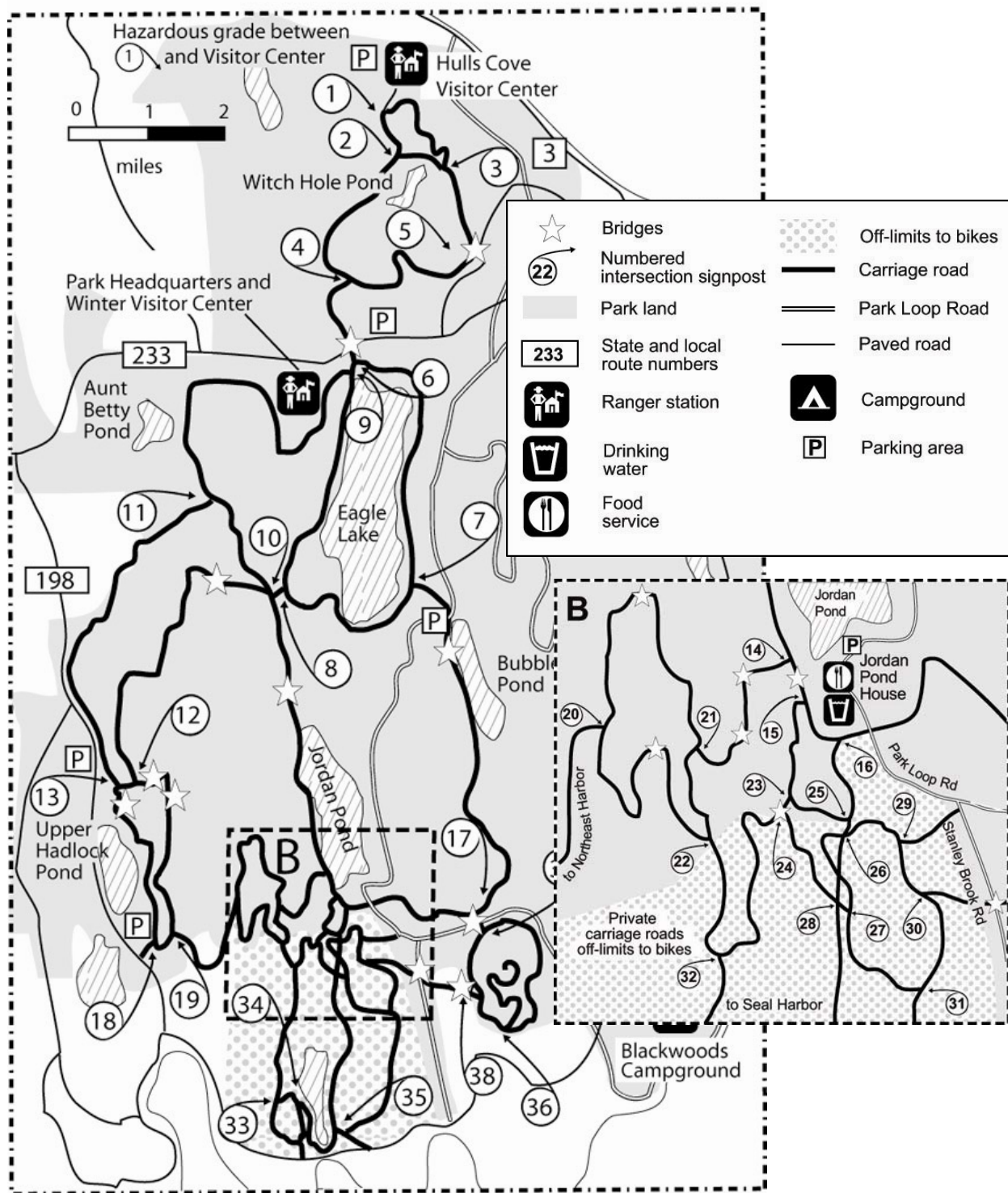


FIGURE 1: ACADIA NATIONAL PARK CARRIAGE ROAD SYSTEM

Crowding standards established for the visitor experience on the carriage roads were:

- Eighty percent of visitors should have a high quality experience 90% of the summer season days (5/15-10/15).
- Total system-wide use for the carriage roads should not exceed 3,000 visitors per day.
- PPV-related standards of quality for High and Low Use Zones are as follows:

In the *High Use Zone*, visitors should see 0 PPV at least 31 minutes of each hour, should see 1-5 PPV no more than 27 minutes of each hour, should see 6-10 PPV no more than 2 minutes out of each hour, and should never see more than 10 PPV.

In the *Low Use Zone*, visitors should see 0 PPV at least 48 minutes of each hour, should see 1-5 PPV no more than 11 minutes of each hour, should see 6-10 PPV no more than 1 minute out of each hour, and should never see more than 10 PPV.

Research showed these three expressions of standards for crowding (80%, 3,000 visitors/day, and PPVs) are equivalent. Eighty percent of visitors should have a high quality experience and PPV standards should not be violated if total carriage road use does not exceed 3,000 visitors per day. A note about terminology is warranted here. Typically, when standards are not met, we state that they are violated, rather than exceeded. There are many potential indicators and standards for visitor experiences and resource conditions; standards may be expressed in terms of “no less than...” or “no more than...” an amount. For example, no less than 80% of visitors should have a high quality carriage road experience, and no more than 3,000 visitors per day should be allowed, to ensure that the standard is not violated. Thus, standards are always “violated”.

The 90% standard for summer season days recognizes that there are some very high use days during the main visitor season and accepts that use will exceed 3,000 per day 10% of the time. Ten percent represents an estimate of the normal number of peak use days (15) occurring between May 15 and October 15, a 150-day season. These peak use days generally occur for 2 days of the Memorial Day, July 4, Labor Day, and Columbus Day holidays (8 days total), and about 7 other days, usually in August. August is the busiest month in the park. Thus when total (system) use exceeds 3,000 per day for the sixteenth day during the season, the crowding standard is violated.

BEHAVIOR STANDARDS

The behavior standards were developed through resident and visitor questionnaires. Standards are based on the average length of a carriage road visit (which is about two hours), the mean behavior levels described in the research, NPS policies, and the purpose of the carriage road system. High Use Zone standards for four problem behaviors were (number of instances per 2 hours): bicycle speed - 2, failure to warn when passing from behind - 2, dogs off leash - 0, and obstructing the road - 1. In the Low Use Zone the standards were: bicycle speed - 1, failure to warn - 1, dogs off leash - 0, and obstructing the road - 1.

In this report, we correct the reporting of flawed behavior means from 1997 (Jacobi 1997b) and 2000 (Jacobi 2001) monitoring activities (see Methods and Results sections). We also revise the expression of the above standards to account for statistical variation using a 90% one-tailed confidence level test for the behavior means (see Methods section).

METHODS

CROWDING

Because of the relationships between the three expressions of crowding standards described above, monitoring crowding was most easily done by monitoring total or system carriage road use on a daily basis. It is this measurement that carries the greatest weight for determining when the crowding standard is violated. Violation of the crowding standard will occur when we are 80%¹ confident carriage road use was greater than 3,000 persons per day for the sixteenth day of the summer season.

Use monitoring was supplemented by direct counts of PPVs as spot checks of a computer simulation model of carriage road visitor use. Researchers developed the simulation model to estimate PPVs (Manning 1998a). Monitoring relies heavily on its validity and outputs. We are unable to conduct enough sample spot checks to represent the entire carriage road system effectively. It would take a much greater effort to obtain a representative sample. To reduce the potential for confusion, we report the results of these spot checks in Appendix 1.

Monitoring Daily Carriage Road System Use

Daily carriage road use was estimated through a regression estimator established between use at an electronic trail counter and twelve censuses of total carriage road use conducted from 2001-2002 (Jacobi 2003b). We had previously developed a regression estimator with censuses conducted from 1995-1997 (Jacobi 1997b). The institution of the Island Explorer bus prompted the development of a new estimator.

Eagle Lake is one of the busiest areas of the carriage roads. An electronic trail counter (Diamond Traffic Products, TTC 4420) on the west side of Eagle Lake monitored visitor use (traffic passing in both directions on the carriage road). Attached to this trail counter was a small computer (Diamond Traffic Products - Pegasus model) recording use hourly. From the trail counter/computer operation, a number representing the amount of traffic at the site was obtained for each day or specific hours of the day.

Twelve carriage road censuses were conducted in 2001 and 2002 with volunteers and park staff counting all entries to the carriage road system from eleven major access points between 9:00 a.m. and 6:00 p.m. (Jacobi 2003b). Because the censuses covered only the hours between 9:00 a.m. and 6:00 p.m., visitor use at the electronic trail counter site on census days was calculated from Pegasus computer data for the same hours (not a 24-

¹ The application of a confidence limit to use estimations will be explained shortly.

hour day). If Pegasus data was not available, the difference between checks of the trail counter's numerical readout shortly before 9:00 a.m. and shortly after 6:00 p.m. was used to calculate traffic at the trail counter. Thus a number representing uncorrected² daily use from the electronic trail counter was calculated on the 12 census days. This number was paired with the final census tally.

A regression relationship ($r^2=0.65$, $F=0.001511$) was established between these pairs of numbers (Appendix 2) and a regression equation developed to estimate total carriage road use from trail counter use. The regression equation was $y = 2.41x + 593$, where x is trail counter use and y is total (predicted) carriage road use.

For each day between July 9 and October 30, 2003, daily use at the trail counter was calculated by adding hourly Pegasus computer data between 9:00 a.m. to 6:00 p.m. In May and June, the Pegasus was under repair. Therefore, until July 9, we relied on our backup checks of the trail counter. These were generally made between 8:00 a.m. and 10:00 a.m., but unfortunately there were many gaps of more than a day during June. For these gaps, we averaged use over the days involved. Back up checks thus represent 24-hour counter use. System-wide daily use estimates were obtained using the Pegasus count from 9:00 a.m. to 6:00 p.m., the difference between daily checks (back-up) of the trail counter, or averages when these gaps were more than a day.

We then compared these system-wide daily use estimates to the standard of 3,000 visitors per day, and applied a level of confidence of 80% to this standard. That is, we want to be 80% sure that we exceed the 3,000 visitor level for any given day, or alternatively, that eight times out of ten, we would exceed 3,000 visitors per day. Because we are only concerned about exceeding 3,000, this is a one-tailed confidence level test. We are not interested in the lower bound of the confidence interval. Through an iterative calculation process (see Appendix 7), we calculated the trail counter use level at which we would be 80% sure that use exceeded 3,000 visitors per day. This count level was 1,154.

In previous monitoring reports, we have calculated monthly totals and averages (see Appendix 6) of carriage road use with 80% confidence intervals. Although our main concern is that visitor use does not exceed 3,000 visitors per day, there is also some interest in trends. Is use increasing or decreasing? Because of that main concern, we conducted all our censuses on busy days, and that is when the regression equation is most accurate (has the smallest confidence intervals). The regression equation overestimates use on drizzly or rainy days when use levels are lower and fewer visitors trip the electronic trail counter. For example, when the trail counter records zero use, the equation still estimates daily 593 visitors because that is the constant in the regression equation. Because low levels of carriage road use are not estimated accurately, monthly totals and averages are skewed upwards, confounding any analysis of trends.

² Trail counters miss some traffic, usually because visitors walk or ride side-by-side or ride too fast to be counted. Trail counter data can be corrected by the ratio of observed use to counter-recorded use so an estimate can be made of actual use. Uncorrected or raw data was used to establish the regression relationship because it had not been transformed in any way. These data are in park files.

To attempt to provide a trend analysis that is slightly better, in this report we analyzed the top ten days only for the months of July and August for previous years using totals and averages. This reduces the variation due to low use; however missing data, different collection methods, and other factors may compromise comparisons still.

BEHAVIORS

The occurrence of problem behaviors was monitored through a brief questionnaire (Appendix 3) administered to visitors as they exited the carriage roads. Visitors who used the carriage roads for less than 15 minutes were excluded from participation. Interviewers read questions to respondents and recorded their answers.

Questions

Question 1 asked for the carriage roads route by intersection number. Interviewers spent the time needed with respondents on this question to get accurate answers. Question 2 asked how many times visitors experienced these four problem behaviors:

Bicycles startling you by passing from behind without warning.

Bicycles travelling at excessive speed.

Dogs off leash.

Visitors obstructing or blocking carriage roads.

Question 3 asked the length of the carriage road visit. Question 4 asked whether visitors were biking, walking, running or horseback riding. Question 5 asked if visitors were permanent or seasonal residents of Mount Desert Island, or not a resident. Question 6 asked if they had used the Island Explorer bus to reach the carriage roads.

Sampling

A representative sample of carriage road visitors was administered questionnaires stratified by location of entry and time of day. Exact dates were randomly selected for equal representation in July and August. Sampling was based on carriage road census data from 2001-2002 (Jacobi 2003b). Because behavior standards were expressed for two use zones, a goal of 200 completed visitor questionnaires was established for each zone, for a total of 400. This was estimated to be the minimum sample size for reliable data. Five hundred questionnaires would be distributed with a response rate expected of 90-95%. Details of the development of the sampling plan and the sampling plan itself are found in Appendix 4.

Visitors were approached as they exited the carriage roads at each sampling location. Interviewers identified themselves, told visitors the park was monitoring the carriage roads visitor experience, and said the questionnaire was voluntary and would take about three minutes. One person per party filled out the questionnaire. If they refused to participate, the next party exiting was immediately approached. If they agreed, the interviewer stayed with them until they finished and then immediately approached the next party exiting. The contact script and site guidelines are in Appendix 3.

Data Analysis

All visitor routes on the carriage roads were examined and assigned to either the High or Low Use Zone based on the intersections passed (by number), distance traveled, length of visit, and time of interview. Most questionnaires were easily assigned to either zone. Some questionnaires were removed from the data analysis because visitor use appeared evenly divided between the two zones based on time and location. Data analysis was generally performed on the each group (zone) of questionnaires separately.

Answers to questions 4 and 5 (user type and residence) were simply tabulated to help assess whether the sample was representative. We compared percentages of user types and residence location to previous research. Answers to question 6 were also simply tabulated to allow us to gauge whether visitors begin to use the Island Explorer more frequently to access the carriage roads, especially changing the number of one-way trips made. This might necessitate a revision of the simulation model. No data analysis was performed on these questions for subgroups.

Correction of Previously Flawed Data Analysis. While preparing this report, we discovered our statistical analysis of behavior means in 1997 (Jacobi 1997b) and 2000 (Jacobi 2001) was flawed. First, the individual observations of the number of occurrences of each behavior for each respondent should have been transformed to a 2-hour basis, and a mean calculated from these transformed data for comparison to the standard. We previously calculated a mean from the original observations and then converted it to a two-hour basis.

Second, the distribution of behaviors is not normal. It is a Poisson distribution and looks somewhat like the right half of a normal distribution. Most observations are at “0”, with some between 1 and 5, and few beyond 5. This requires a different statistical treatment to determine confidence intervals and other statistics. In a Poisson distribution, the standard deviation is approximated by the square root of the mean. With the standard deviation calculated this way, the t-distribution was used to calculate confidence intervals.

Because we are concerned only with statistically determining if our means exceeded the standard, we performed a one-tailed confidence test for the upper bound. We chose a 90% level for this test. With a large number of observations for each behavior and each zone (200+), the t-value was 1.645. The upper bound was calculated as the mean plus 1.645 times the standard deviation (in this case, the square root of the mean).

We calculated the means and confidence intervals as described above for 1997, 2000, and 2003 for this report, correcting previous errors in the 1997 (Jacobi 1997b) and 2000 (Jacobi 2001) reports. Taking account of statistical variation, the behavior standard can be re-stated: the 90% confidence limit for the upper bound must be less than the standard (0, 1, or 2)

Outliers are unusually high or low data observations. It is difficult to know if they are true observations or the result of errors in recording, transcription, or measurement. For behaviors, visitors clearly cannot count the number of occurrences of these behaviors once they go beyond a certain level; they are estimating based on their subjective experience. Any high behavior outliers may be the result of visitors attributing all past experiences to today's experience, extreme sensitivity to certain behaviors, or a knee-jerk response to 1-2 very bad encounters. Outliers may have a substantial affect on the means for these behaviors and are not representative of the typical experience visitors have on the carriage roads. If a visitor reports 1000 encounters with speeding bikes, this is clearly an observation that needs to be noted, but discarded from analysis. But what about 100, or 50, or 25 encounters? Where do you draw the line?

A reasonable method for dealing with outliers in this behavior dataset was needed. Previously, this had not been addressed. We decided to apply a 1% rule. One percent of our typical dataset of 200-250 questionnaires for each zone is 2 observations. Therefore we discarded from analysis the highest 1% of observations, or generally the highest two observations for any particular behavior in a zone. We then calculated the means and the 90% one-tailed confidence limit.

These new statistical approaches described here will now be used in the analysis of future monitoring data.

RESULTS

DAILY CARRIAGE ROAD USE ESTIMATIONS

Pegasus computer data for each day (9:00 a.m. to 6:00 p.m.) was consistently in a bell curve, and within expectations of typical use given past data and experience. We did not reject any data because it seemed excessively high (this has happened in previous years for unknown reasons). Occasionally, a set of consecutive hours of zero use occurred when use would normally be expected. Comparing these days (September 4, October 15, 21, 27 and 29) to the park's air quality/weather monitoring data showed a combination of rain, high humidity, and wetness (dew) on the same days. In these conditions, moisture on the equipment lenses causes the counter to shut down until conditions dry out.

Figures 2, 3, and 4 show the estimated daily carriage road use calculated from the regression equation for June, July, August, September, and October. Numerical results are in Appendix 5. There were several days of lost data in early August because of a loose wire. For the month of June and early July, some data was averaged because of infrequent trail counter checks. For two days in September we could not interpret data after charging the Pegasus. Estimated use for July and August for all previous years is compared in Appendix 6.

July 2003 had four days with estimated daily visitation over 2,000; August had six, but would likely have had more if data had not been lost. The highest estimate was 2,247 on

August 20. Applying the 80% one tailed confidence limit shows that we can be 80% sure the highest carriage road daily use was less than $2,247 + 194$ or 2,441. PPV standards were not violated in 2003. Confidence limits were applied to each day (see Appendix 7).

COMPARISON OF THE TOP TEN DAYS IN JULY AND AUGUST, 1995-2003

Comparisons are useful for understanding trends in carriage road visitor use over time. Eight years of data (1995, 1997 - 2003) are available but they must be treated with caution because of problems with data collection. Data from 1997 (Jacobi 1997b), 1998 (Jacobi 1998) and 1999 (Jacobi 2000) were compromised to some extent by equipment problems creating data loss and overcounts. 2002 and 2003 estimates are derived from the new regression equation but can be compared with previous years. The 1995 data was also collected using slightly different equipment. We used a TT501 computer in 1995, also manufactured by Diamond Traffic Products. The electronic trail counters used in 1995 had not been upgraded with new circuitry yet. Upgrading caused problems in 1996 resulting in complete data loss for the season. We used the daily 1995 TT501 computer data for July and August 1995 (9:00 a.m. to 6:00 p.m. only) in the regression equation developed through the censuses. In 2002, we upgraded to a TTC 4420 traffic counter set for the same sensitivity (speed) as our earlier model.

Tables 1 and 2 show the data for the top ten busiest days of July and August for 1995 and 1997-2003, including the mean daily use each year for these ten days with an 80% confidence interval. The number of days each month with use above 2000 persons per day is also included. No trend is discernable for either month. The top ten analysis helps understand what use is like on the busiest sunny days in these months.

**TABLE 1: TOP TEN CARRIAGE ROAD VISITOR USE DAYS FOR JULY 1995 AND 1997-2003
WITH 80% CONFIDENCE INTERVAL FOR THE MEAN
AND THE NUMBER OF DAYS WITH MORE THAN 2000 VISITORS**

	1995	1997	1998	1999	2000	2001	2002	2003
1	2937	2384	1930	2099	2273	2066	2150	2114
2	2758	2344	1927	2023	2036	1827	1944	2088
3	2616	2088	1849	1927	1862	1598	1887	2015
4	2125	2012	1759	1849	1862	1596	1734	2011
5	2056	1990	1732	1808	1849	1587	1661	1996
6	2018	1966	1672	1808	1813	1579	1642	1938
7	1949	1960	1672	1775	1802	1566	1636	1924
8	1894	1919	1636	1751	1721	1511	1634	1895
9	1832	1884	1606	1745	1715	1484	1596	1796
10	1801	1876	1582	1721	1704	1460	1593	1796
Total	21986	20423	17365	18506	18638	16274	17476	19574
Mean	2199	2042	1737	1851	1864	1627	1748	1957
80% CI	225	218	209	212	212	208	257	266
N=2000+	6	4	0	2	2	1	1	4

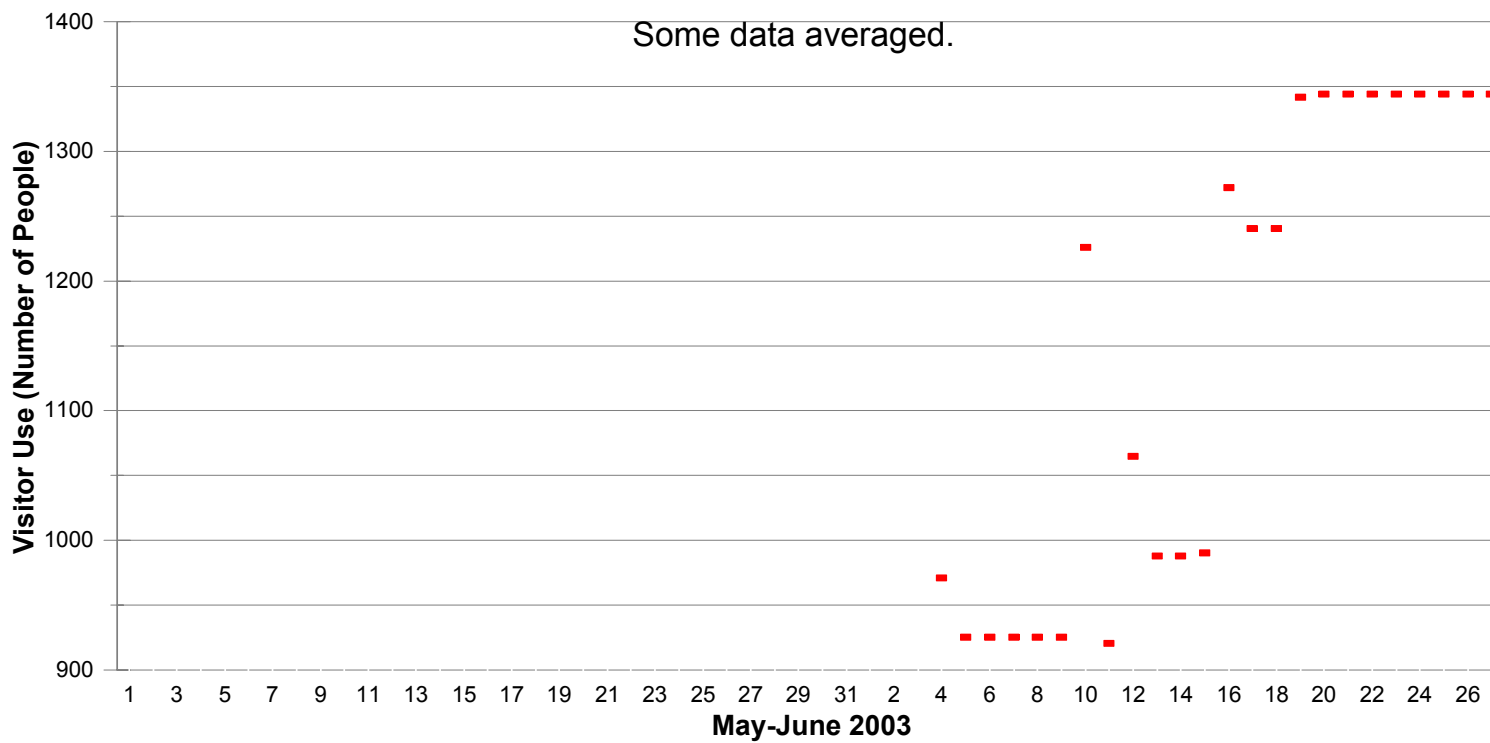


FIGURE 2: ESTIMATED CARRIAGE ROAD VISITOR USE FOR MAY - JUNE, 2003.

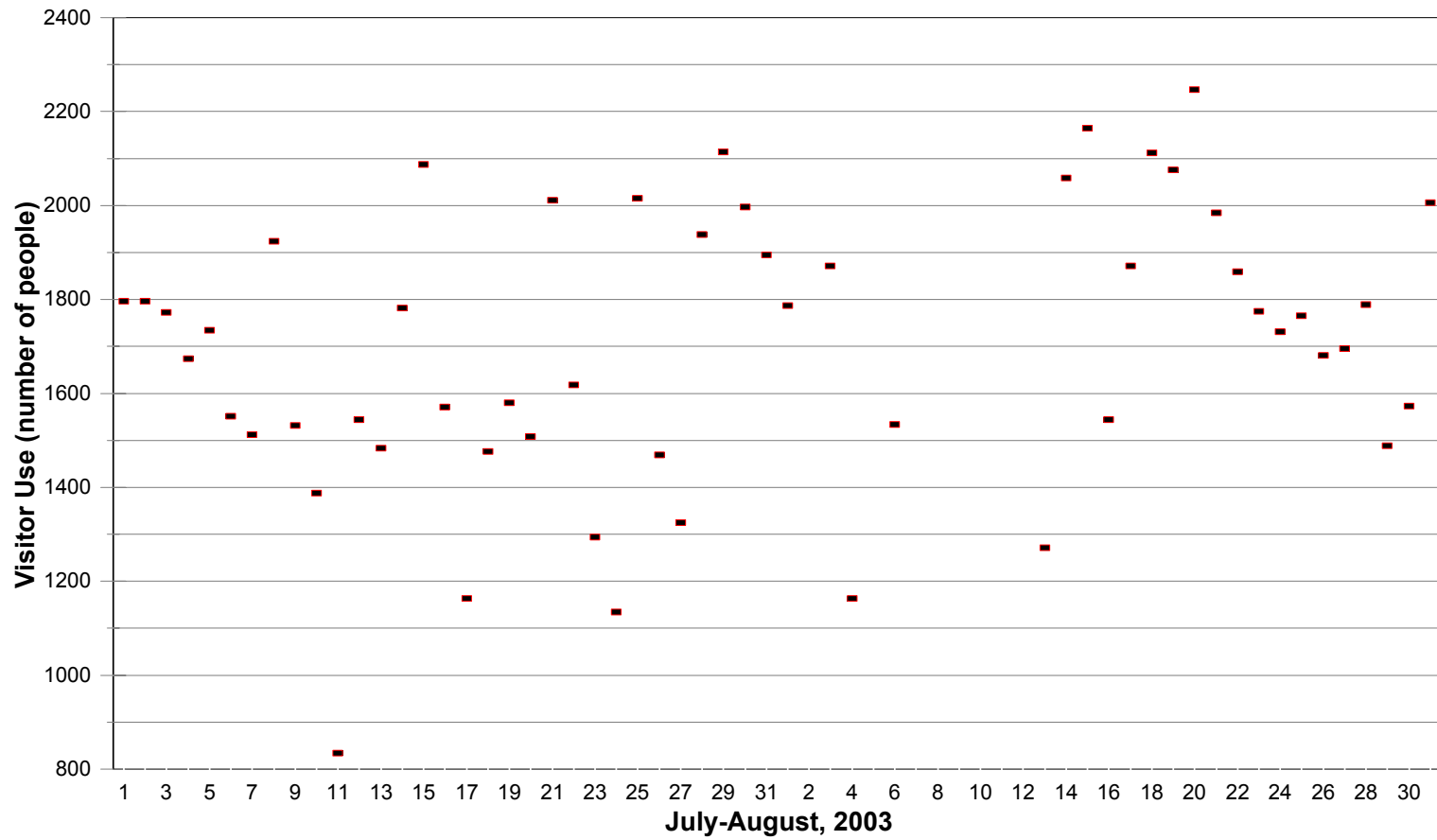


FIGURE 3: ESTIMATED CARRIAGE ROAD VISITOR USE FOR JULY - AUGUST 2003.

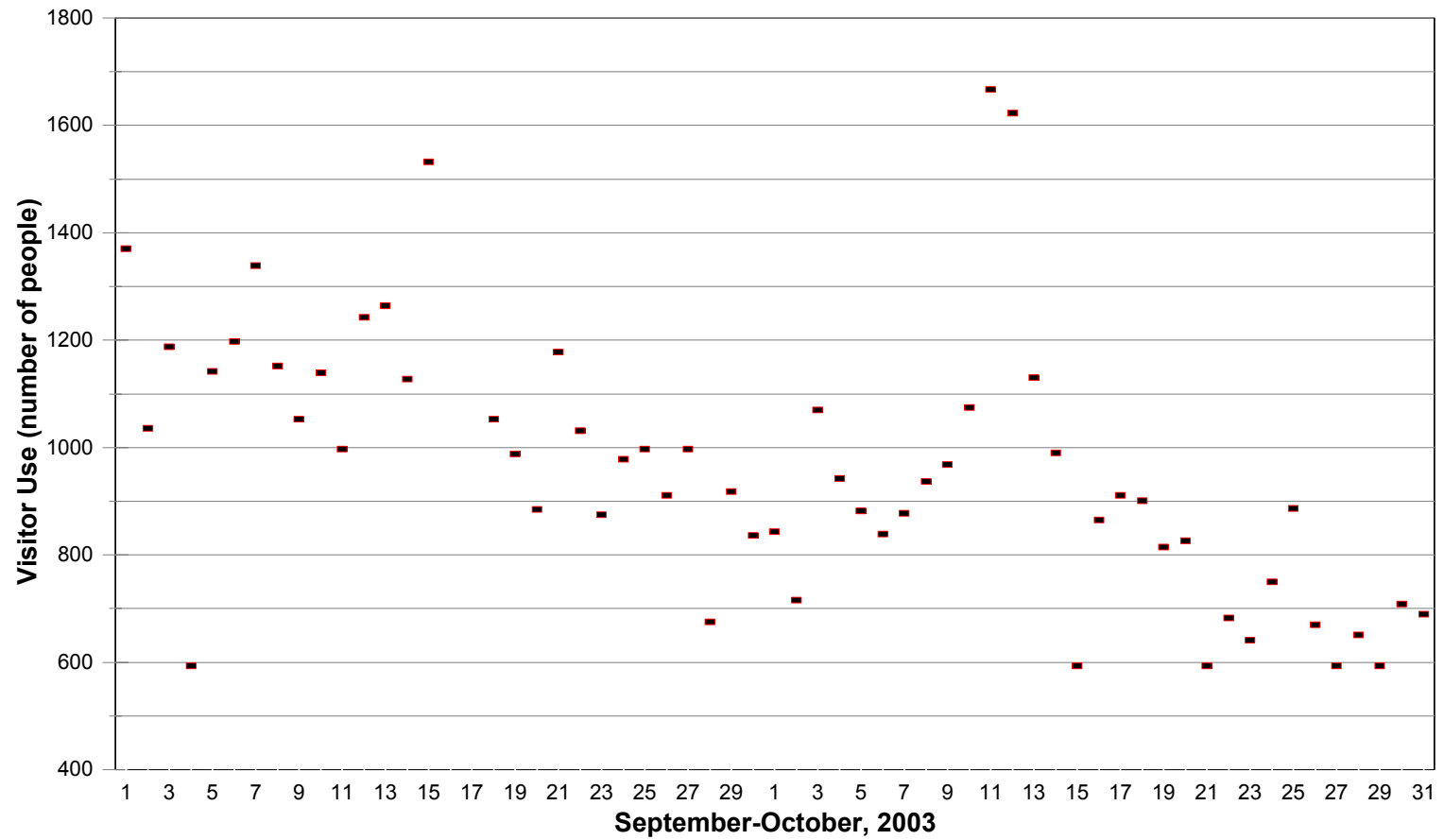


FIGURE 4: ESTIMATED CARRIAGE ROAD VISITOR USE FOR SEPTEMBER - OCTOBER 2003.

**TABLE 2: TOP TEN CARRIAGE ROAD VISITOR USE DAYS FOR AUGUST 1995 AND 1997-2003
WITH 80% CONFIDENCE INTERVAL FOR THE MEAN
AND THE NUMBER OF DAYS WITH MORE THAN 2000 VISITORS**

	1995	1997	1998	1999	2000	2001	2002	2003
1	2561	2795	2333	2613	3132	2142	2561	2246
2	2460	2714	2292	2613	2811	2072	2227	2165
3	2357	2616	2267	2504	2504	1941	2099	2112
4	2315	2512	2267	2330	2431	1933	2069	2076
5	2198	2325	2246	2319	2403	1857	1979	2059
6	2153	2289	2189	2316	2112	1756	1952	2006
7	2084	2270	2069	2205	2017	1732	1933	1984
8	2070	2229	1985	2191	1985	1699	1870	1871
9	2046	2004	1966	2180	1933	1680	1862	1871
10	1970	1998	1898	2164	1930	1677	1835	1859
Total	22214	23752	21512	23435	23259	18488	20387	20248
Mean	2221	2375	2151	2344	2326	1849	2039	2025
80%CI	226	234	222	232	231	212	274	272
N=2000+	9	9	7	10	7	2	4	6

BEHAVIORS

Four hundred sixty-six questionnaires were completed by visitors. Thirty-four others were incomplete and unusable, or could not be classified as either the High or Low Use Zone. Seven people declined to participate. Of the 466 questionnaires, 44% (n=206) were assigned to the High Use Zone and 56% (n=260) to the Low Use Zone. These are reasonably close to the target of 250 for each zone, indicating the sampling worked well. Comparing results with earlier research (not monitoring) must be done with caution because of differences in sampling. Only one such comparison will be made later in this report.

The entire sample represents eight hundred forty-three hours of carriage road visits; the average length was 108 minutes. Thirteen percent of respondents were summer residents and 13% were year-round residents of Mount Desert Island; 74% were not residents. Sixty-one percent of respondents were bikers, 25% walkers, and 11% runners. Three percent were equestrians. Less than 5% used the Island Explorer bus for access.

Four hundred ten hours of carriage road visits are represented in the Low Use Zone sample. The average visit length was 95 minutes. Sixteen percent of respondents were seasonal residents and 15% were year-round residents of Mount Desert Island. Non resident visitors comprised the remaining 69%. Forty-nine percent of Low Use Zone respondents were bicyclists, 30% walkers, and 16% runners. Five percent were equestrians. Three percent used the Island Explorer bus to reach the carriage roads.

Four hundred thirty-three hours of carriage road visits are represented in the High Use Zone sample. The average length of a visit was 126 minutes. Nine percent of respondents were seasonal residents and 10% were year-round residents of Mount Desert Island. Non resident visitors comprised the remaining 81%. Seventy-five percent of High

Use Zone respondents were bicyclists, 20% walkers, and 4% runners. Less than 1% were equestrians. Six percent used the Island Explorer bus to reach the carriage roads.

These results are consistent with previous research and monitoring. Residents are more often walking than biking, staying less time than other visitors, and entering at times and places when it is less busy. Compared with the 1997 monitoring sample, the 2000 and 2003 samples have greater representation from residents, walkers, and equestrians.

Table 3 shows the means and 90% confidence limits for the upper bound for all four behaviors, for each zone, and for each monitoring year (1997, 2000, and 2003). Numbers in bold indicate violations of the standard. With recalculations of means and application of the confidence limit, we see that the *Startling* behavior standard was violated in 1997 and 2000 in the Low Use Zone, the *Dog Off Leash* behavior standard was violated for every year and zone, and the *Obstruction* behavior standard was violated in every year for the High Use Zone. We came close (within 0.2) of violating a few other standards. We offer a recommendation for addressing these violations in the Summary section of this report.

Through iteration we can determine the means for which violations of the standards of one or two behaviors per carriage road visit will occur for the 90% one-tailed confidence test. These means are 0.223 for a standard of 1 and 0.661 for a standard of 2.

TABLE 3: MEAN NUMBER OF OCCURRENCES OF PROBLEM BEHAVIORS AND THE 90% CONFIDENCE LIMIT FOR THE UPPER BOUND FOR THE LOW AND HIGH USE ZONES, 1997, 2000, AND 2003.

Low Use	Startle Mean	Startle 90% UB	Speed Mean	Speed 90% UB	Dogs Mean	Dogs 90% UB	Obstruction Mean	Obstruction 90% UB
Standard		1		1		0		1
1997	0.25	1.08¹	0.18	0.89	0.29	1.17	0.08	0.56
2000	0.31	1.22	0.15	0.79	0.33	1.28	0.15	0.79
2003	0.06	0.47	0.10	0.62	0.20	0.93	0.11	0.64

High Use	Startle Mean	Startle 90% UB	Speed Mean	Speed 90% UB	Dogs Mean	Dogs 90% UB	Obstr Mean	Obstr 90% UB
Standard		2		2		0		1
1997	0.28	1.15	0.41	1.45	0.09	0.59	0.28	1.16
2000	0.18	0.88	0.41	1.47	0.18	0.86	0.33	1.28
2003	0.14	0.76	0.16	0.81	0.13	0.72	0.37	1.38

1. Numbers in bold are violations of standards.

SUMMARY AND RECOMMENDATIONS

Regression equation estimations of carriage road use levels indicate that the crowding standard was not violated. The 3,000 persons-per-day limit was not exceeded, based on a one-tailed 80% confidence level. Encouraging large groups to break into smaller groups of ten or less people is still strongly recommended as a general measure to mitigate crowding as expressed through PPVs.

Behavior standards were violated for the *Dog Off Leash* behavior every year and in each zone (six times). Behavior standards for the *Startle* behavior were violated twice in the Low Use Zone. Behavior standards for the *Obstruction* behavior were violated every year (three times) in the High Use Zone. We recommend one more monitoring period, now scheduled for 2006, before reevaluating these violations and the standards established for these four behaviors and deciding what course of action, beyond the education actions recommended below, is needed. Four years of data points is still not enough for determining a trend, but it should suffice for this reevaluation.

Based on a complaint letter received earlier this year (2003) regarding the *Obstructing* behavior, the continuing problems with dogs off leash throughout the park, and the data above, we do recommend reinvigorating our staff education efforts *now* regarding these behaviors. Just as Leave No Trace is a part of staff training, so should be a review of carriage road courtesy guidelines. All staff should be strongly encouraged to offer brief reminders to “violators” at every opportunity, especially for obstructing the road and dogs off leash. All enforcement and education of visitors regarding dogs should be re-emphasized again also; all staff should make an effort to contact visitors with dogs off leash (and dogs on leash to offer thanks). The sign committee should consider added signs for this as was suggested in public comments on the hiking trails plan. The dog on leash symbol is lost somewhat in the trailhead exhibits. Education must be a sustained program to achieve behavior standards. We will cover all of this in more depth in the 2006 report.

LITERATURE CITED

- Jacobi, C.
2003a Monitoring carrying capacity on Acadia National Park carriage roads: 2002 (crowding). Acadia National Park Natural Resources Report Number 2003-2. January. 21pp
- Jacobi, C.
2003b Developing a regression equation to estimate Acadia National Park carriage road use using censuses and electronic trail counters: 2001-2002. Acadia National Park Natural Resources Report Number 2003-1. March. 7pp.
- Jacobi, C.
2002 Monitoring carrying capacity on Acadia National Park carriage roads: 2001 (crowding). Acadia National Park Natural Resources Report Number 2002-4. April. 19pp
- Jacobi, C.
2001 Monitoring carrying capacity on Acadia National Park carriage roads: 2000 (crowding and behaviors). Acadia National Park Natural Resources Report Number 2001-1. February. 22pp
- Jacobi, C.
2000 Monitoring carrying capacity on Acadia National Park carriage roads: 1999 (crowding). Acadia National Park Natural Resources Report Number 2000-4. April. 22pp
- Jacobi, C.
1998 Monitoring carrying capacity on Acadia National Park carriage roads: 1998 (crowding). Acadia National Park Natural Resources Report Number 98-5. December. 15pp
- Jacobi, C.
1997a Applying the visitor experience resource protection process to Acadia National Park carriage roads: a summary of research and decision-making. Acadia National Park Natural Resources Report Number 97-10. December. 23pp.
- Jacobi, C.
1997b Monitoring carrying capacity on Acadia National Park carriage roads: 1997. Acadia National Park Natural Resources Report 97-11. December 1997. 20pp.
- Manning, R., W. Valliere, B. Wang, N. Ballinger, and C. Jacobi
1998a Acadia National Park carriage road study: phase II research. Technical Report NPS/NESO-RNR/NRTR/98-3.

Manning, R., W. Valliere, N. Ballinger, and C. Jacobi
1998b Acadia National Park carriage road study: phase III research. Technical
Report NPS/NESO-RNR/NRTR/98-1..

Manning, R., C. Negra, W. Valliere and C. Jacobi
1996 Acadia National Park carriage road study: phase I research. Technical
Report NPS/NESO-RNR/NRTR/96-07. January. Department of the Interior.
National Park Service. 61pp.

National Park Service
1997 The visitor experience and resource protection (VERP) framework: a
handbook for planners and managers. Denver Service Center. Denver, Colorado.
103pp.

APPENDIX 1: SPOT CHECKS OF PPV COUNTS

METHODS

Because we are unable to conduct enough sample spot checks to represent the entire carriage road system effectively, when spot checks are greater than the PPV standards we will state that PPV standards are exceeded rather than violated. Violations of the crowding standard will refer only to the use limit of 3,000 visitors per day.

We made direct PPV counts of carriage road use from selected locations in the High Use and Low Use Zones as a spot check of the computer simulation model. Counts were made only on days with good weather when carriage roads were busy. Twenty counts were scheduled (ten in each zone). Low Use zone sites were Giant Slide, Seven Sisters, Around Mountain, Day Mountain Summit, and Jordan Stream. High Use Zone sites were Witch Hole Pond (new name-same site as Paradise Hill in past), Eagle Lake West, Eagle Lake South, Wildwoods, and Jordan Pond. Exact locations are described in field notes. General locations are shown in Figure A1. Table A1 shows the count schedule.

Five of the Low Use Zone counts were made in the High Use zone geographic location but during the Low Use Zone time (before 10:00 a.m. or after 5:00 p.m.). A PPV count consisted of up to five people counting simultaneously at each of the five sites as grouped above. The counts were largely made by the three Friends of Acadia (FOA) ridgerunners and the FOA intern, supplemented by other park staff and volunteers as needed.

For all counts and all locations, personnel were stationed at the same end of a 100-meter segment of carriage road observing traffic as it entered or exited their field of view around a curve. This left no room for judgment about distant persons being within the 100-meter viewscape. Anyone in the field of view was counted. At 15-second intervals, observers counted or estimated the number of persons in the viewscape. If visitors stopped in the viewscape, they were not counted until they began moving again. Stationary persons could skew counts upward. Concentrating on moving traffic was the simplest solution. Count sites were selected for a low probability of visitors stopping. Data were aggregated for each count (5 people, 5 sites). Each individual observation at 15 second intervals was allocated to one of these PPV ranges: 0, 1-5, 6-10, 11-15, 16-20, 21-30. The number of observations in each PPV range was then counted and divided by four to tally the number of minutes observers saw visitor traffic in each range. The number of minutes was then divided by the number of observers (usually five) to obtain the number of minutes per hour to compare monitoring results to PPV standards.

RESULTS

Direct counts of PPVs were made on nine days: July 1, 8, 14, 15, 22, 27, 29, and August 13 and 17. On three days, only 4 people were available to count. Results for the High Use and Low Use Zones are in Tables A2 and A3. Standards exceeded are in bold type.

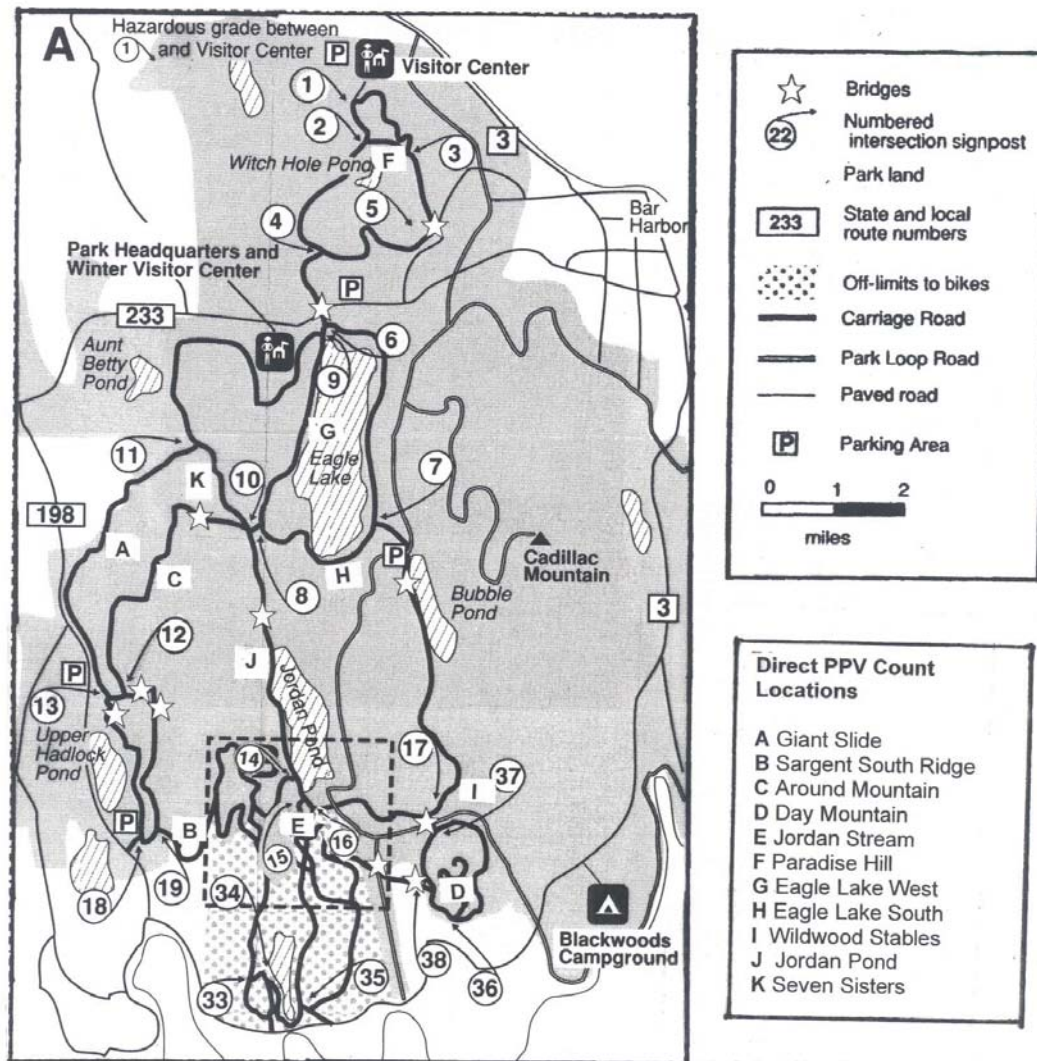


Figure 1: Acadia National Park Carriage Road System

Figure A1: Acadia National Park Carriage Road System: Spot Check Locations

Table A1: Direct PPV Count Schedule for the High Use and Low Use Zones.

Count #	Date	Zone	Time
1	7/01/03	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	10-11
2	7/01/03	Low Use Zone (7 Sist, Arnd Mtn, G Slide, Day Mtn, J Stream)	12-1
3	7/08/03	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	11-12
4	7/08/03	Low Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	9-10
5	7/14/03	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	12-1
6	7/14/03	Low Use Zone (7 Sist, Arnd Mtn, G Slide, Day Mtn, J Stream)	2-3
7	7/15/03	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	1-2
8	7/15/03	Low Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	5-6
9	7/22/03	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	2-3
10	7/22/03	Low Use Zone (7 Sist, Arnd Mtn, G Slide, Day Mtn, J Stream)	12-1
11	7/27/03	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	10-11
12	7/27/03	Low Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	9-10
13	7/29/03	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	11-12
14	7/29/03	Low Use Zone (7 Sist, Arnd Mtn, G Slide, Day Mtn, J Stream)	1-2
15	8/13/03	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	12-1
16	8/13/03	Low Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	5-6
17	8/17/03	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	1-2
18	8/17/03	Low Use Zone (7 Sist, Arnd Mtn, G Slide, Day Mtn, J Stream)	11-12
19	missed	High Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	2-3
20	missed	Low Use Zone (Witch Hole, Eagle Lake W and S, WWS, J Pond)	9-10

Table A2: Number of Minutes in Each PPV Range for Direct Counts in the High Use Zone.

PPV Range	Standard	07/01 n=5	07/08 N=5	07/14 n=5	07/15 n=5	07/22 n=4	07/27 n=4	07/29 n=5	08/13 n=5	08/17 n=4	missed
0	Not < 31	50.4	49.8	46.05	48.7	51.975	52.75	42.1	42.55	48	
1-5	Not > 27	9.45	9.85	13.45	11.05	7.5625	7.125	16.25	16.75	11.5	
6-10	Not > 2	0.15	0.35	0.4	0.25	0.5	0.125	1.55	0.65	0.5	
11-15	Not > 0	0	0	0	0	0	0	0.1³	0	0	
16-20	Not > 0	0	0	0	0	0	0	0	0	0	
20-30	Not > 0	0	0	0	0	0	0	0	0	0	

³ Standards exceeded are in bold type.

There was one day when standards were exceeded in the High Use Zone and five in the Low Use zone. The five exceedances in the Low Use Zone were for the 6-10 person PPV range; the one in the High Use Zone was in the 11-15 PPV range.

TableA3: Number of Minutes in Each PPV Range for Direct Counts in the Low Use Zone.

PPV Range	Standard	07/01 n=5	07/08 n=5	07/14 n=5	07/15 n=5	07/22 n=4	07/27 n=4	07/29 n=5	08/13 n=5	08/17 n=4	missed
0	Not < 48	53.35	56.6	57	52.9	58.125	54.375	55.7	54.7	48.9375	
1-5	Not > 11	6.35	3.35	3	7.05	1.875	5.625	4.15	5.3	11	
6-10	Not > 1	0.3	0.05	0	0.05	0	0	0.15	0	0.0625	
11-15	Not > 0	0	0	0	0	0	0	0	0	0	
16-20	Not > 0	0	0	0	0	0	0	0	0	0	
20-30	Not > 0	0	0	0	0	0	0	0	0	0	

In the Low Use Zone, the exceedances occurred at Jordan Stream, Eagle Lake West, and Eagle Lake South from 9am-10am, and Day Mountain from 1pm-2pm. In the High Use Zone, exceedances occurred at Eagle Lake West and Wildwood Stables from 11am-12 noon.

Our experience is that bicyclists are usually counted twice and walkers three times as they traverse the 100 meters. Two exceedances were the result of the same group counted two or more times.

There was one other time when counts were close to the standards. On 8/17/03, we almost exceeded the standards for the 0 (no less than 48 minutes) and 1-5 person (no more than 11 minutes) PPV ranges in the Low Use Zone. We measured 48.9375 and 11 minutes respectively in these ranges. According to trail counter data, this was not an exceptionally busy day; an estimated 1,871 persons entered the carriage road system. There is no obvious reason for this close approach to the standard. The simulation model would not predict even a near exceedance at that use level. A closer look at the data shows that the Eagle Lake West site alone had over 20 minutes of steady traffic in the 1-5 PPV range that day from 9am-10am. This usually busy access point apparently got busy earlier and contributed the most by far to the near exceedance of the standard.

We should remember these PPV counts are simply a spot check. Nonetheless they provide the only direct measure of the key part of the standards (PPVs), since we rely heavily on the indirect measure of total use and the relationship between total use and PPVs. Occasional exceedances during direct counts, such as those in 2003, are probably not a cause for concern. This may be because: 1. the standard is too strict, 2. there are large groups travelling in a pack, or 3. use is high. An increase in the number of these exceedances (or close approaches) of spot PPV counts would raise concern, especially in the lower PPV ranges.

APPENDIX 2: TRAIL COUNTER STATISTICS AND CENSUS DATA 2001-2002

Date	Trail Counter	Census	Ratio
July 3, 2001	502	1956	25.66%
July 13, 2001	335	1374	24.38%
July 19, 2001	419	1770	23.67%
July 27, 2001	464	1956	23.72%
August 2, 2001	403	1736	23.21%
August 16, 2001	649	2127	30.51%
July 9, 2002	374	1178	31.75%
July 18, 2002	471	1487	31.67%
July 25, 2002	422	1643	25.68%
August 2, 2002	511	1704	29.99%
August 13, 2002	636	2104	30.23%
August 16, 2002	531	1840	28.86%
Average	476.41667		

Regression Statistics

Multiple R	0.806966402277151
R Square	0.651194774404128
Adjusted R Square	0.616314251844541
Standard Error	178.25915838376
Observations	12

Analysis of Variance

	df	Sum of Squares	Mean Square	F	Significance F
Regression	1	593241.641593241	593241.641189818	6.6929525759	0.001511224265161
Residual	10	189804.476863	18980.4476863		
Total	11	911004.9166667			

	Coefficients	Standard Error	t Statistic	P-value	Lower 95.00%	Upper 95.00%
Intercept	592.880626068	270.3342972	2.193138761	0.000050689	-9.461724636	92743
x1	2.40693239236	0.557057374	4.320797988	0.001213053	1.165731209	3.648133575

APPENDIX 3: CARRIAGE ROAD CONTACT SCRIPT AND QUESTIONNAIRE

Hi. Have you folks got a moment? (I'm Charlie Jacobi, a volunteer for the park.) It looks like you've just finished a ride/walk on the carriage roads... (I'd like to make you an offer you can refuse.) We're monitoring the experience on the carriage roads through a brief questionnaire that will take about three minutes of your time. Participation is voluntary. We'd like to have your help if you are interested.

Please use the above script as closely as possible when contacting people. What is in parentheses is optional. Visitors will be contacted as they leave the carriage roads so their experience is complete and the least disturbance is caused. They should have been out there at least 15 minutes. Only one person per party is needed to fill out the questionnaire. Others can help if they like. You must help them with the first question using the map. You can then give them the clipboard for the other questions. Once they are finished, or you are finished with them contact the next party exiting the carriage roads, or returning to their car.

Other Guidelines:

At Bubble Pond and the three lots at Jordan Pond, you should work the parking lots for respondents as they return to their cars. The overflow parking area is often the best spot at Jordan Pond. At Eagle Lake work the main exit to the parking area most of the time, and vary it by going to the boat launch or working the road. At Brown and Parkman you can also work the parking lots. If rain or low traffic causes us to miss our quota, we will go out the next day at the same time and location.



APPENDIX 3 (cont.): Acadia National Park 2003 Carriage Road Monitoring Survey

OMB Number: 1024-0224 Expires: Feb. 28, 2004 NPS Number: 03-11

1. What was your route on the carriage roads today? Please list intersection numbers in order.

2. Please indicate the number of times you experienced the following behaviors on your visit to the carriage roads today. If you did not experience a particular behavior today, please enter zero. Please enter a number in each blank.

Bicycles startling you by passing from behind without warning.

Bicycles traveling at excessive speeds.

Dogs off leash.

Visitors obstructing or blocking carriage roads.

3. How long (hours and minutes) was your trip on the carriage roads today? _____

4. Which of the following was your primary activity on the carriage roads today? Circle one.

Biking

Walking

Running

Horseback riding

5. Which of the following best describes your residency on Mount Desert Island? Check one.

Permanent Resident____ Summer Resident (returning annually for 1-6 months)____ Not a Resident____

6. Did you use the Island Explorer Bus to reach the carriage roads today? Circle one.

Yes

No

Thank you for your help.

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by Acadia National Park managers to maintain high quality visitor experiences on the park carriage road system. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. The information you provide will be anonymous. Please do not put your name or that of any member of your group on the questionnaire. Data collected through visitor surveys may be disclosed to the Department of Justice when relevant to litigation or anticipated litigation, or to appropriate Federal, State, local, or foreign agencies responsible for investigating or prosecuting a violation of law. Public reporting burden for this form is estimated to average four minutes per respondent. Direct comments regarding burden estimate or any other aspect of this form to the Office of Information and Regulatory Affairs of OMB, Attention Desk Officer for the Interior Department, Paperwork Reduction Project 1024-0164, Office of Management and Budget, Washington, D.C. 20503, and to the Information Collection Clearance Officer, Accountability and Audits Team, National Park Service, 1849 C Street, N.W., Washington, DC 20240. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Number_____

Date/Time_____

Site_____

Interviewer_____

(The above information will be entered by the interviewer.)

APPENDIX 4: SAMPLING PLAN AND DEVELOPMENT

	AM 9-10	AM 10-11	AM 11-12	PM 12-1	PM 1-2	PM 2-3	PM 3-4	PM 4-5	PM 5-6	Total	Low Zone	High Zone
VC	254	336	304	248	191	130	122	82	57	1724	2650	3200
DB	459	712	659	564	391	322	218	208	193	3726	3016	3034
EL	600	716	626	438	373	401	360	232	164	3910	802	2479
ELB	323	782	610	521	356	296	221	100	105	3314	6468	1888
BPS	83	97	114	132	61	104	44	81	61	777		1635
BPN	116	83	109	80	87	74	100	61	40	750		1261
JPE	101	152	178	173	109	75	59	41	13	901		910
JPW	166	322	434	323	320	233	137	105	45	2085		14407
BR	225	405	322	199	143	143	145	105	54	1741		
PK	235	221	263	145	102	100	115	82	68	1331		
WWS	88	79	110	63	102	81	67	24	2	616		
	2650	3905	3729	2886	2235	1959	1588	1121	802	20875		

	AM 9-10	AM 10-11	AM 11-12	PM 12-1	PM 1-2	PM 2-3	PM 3-4	PM 4-5	PM 5-6		
VC	254	336	304	248	191	130	122	82	57		Low Zone
DB	459	712	659	564	391	322	218	208	193	VC	4.81%
EL	600	716	626	438	373	401	360	232	164	DB	10.08%
ELB	323	782	610	521	356	296	221	100	105	EL/ELB	18.43%
BPS	83	97	114	132	61	104	44	81	61	BPS/BPN	4.64%
BPN	116	83	109	80	87	74	100	61	40	JPE/JPW	5.02%
JPE	101	152	178	173	109	75	59	41	13	BR	26.92%
JPW	166	322	434	323	320	233	137	105	45	PK	20.58%
BR	225	3200	3034	2479	1888	1635	1261	910	54	WWS	9.52%
PK	235								68		
WWS	88								2		High Zone
	2650								802	VC	9.81%
										DB	21.34%
BR		405	322	199	143	143	145	105	1462	EL/ELB	41.87%
PK		221	263	145	102	100	115	82	1028	BPS/BPN	8.52%
WWS		79	110	63	102	81	67	24	526	JPE/JPW	18.47%
		705	695	407	347	324	327	211	3016		

This spreadsheet shows how the sampling regime for distributing carriage road questionnaires was developed for use in 2003. It shows all the census data for 2001-2002 distributed by location and time of day. The heavy black line circumscribes the high use zone data which totals 14407. All else is low use zone data which totals 6468. Percentages were calculated by adding the appropriate numbers and dividing by 6468 or 14407. Percentages were then used to allocate questionnaires to each site in each zone as shown on the next page.

APPENDIX 4: SAMPLING PLAN AND DEVELOPMENT (CONT.)

High Zone	Percent	N Total	N=10-130	N=130-5
VC	9.81%	25	13	12
DB	21.34%	53	26	27
EL/ELB	41.87%	105	53	52
BP	8.52%	21	10	11
JP	18.47%	46	23	23

250 125 125

Low Zone				
Date	Location	Time	N	DOW
07/07	DB	<10	13	M
07/07	JP	<10	6	M
07/09	EL	>5	11	W
07/13	WWS	10-130	10	SU
07/17	PK	130-5	10	H
07/18	PK	<10	6	F
07/19	PK	10-130	10	SA
07/19	EL	<10	12	SA
07/21	WWS	<10	2	M
07/23	BR	<10	6	W
07/23	BP	<10	6	W
07/25	BR	10-130	14	F
07/26	VC	<10	6	SA
07/31	BR	130-5	14	H
08/01	BR	130-5	14	F
08/02	EL	>5	12	SA
08/04	WWS	>5	2	M
08/04	PK	130-5	9	M
08/04	BR	>5	5	M
08/07	BR	10-130	14	H
08/09	PK	10-130	10	SA
08/10	WWS	130-5	10	SU
08/10	DB	>5	12	SU
08/11	EL	<10	11	M
08/12	BP	>5	6	T
08/26	VC	>5	6	T
08/26	JP	>5	7	T
08/31	PK	>5	6	SU

Low Zone	Percent	N Total	N<10	N>5	N=10-130	N=130-5
VC	4.81%	12	6	6		
DB	10.08%	25	13	12		
EL/ELB	18.43%	46	23	23		
BP	4.64%	12	6	6		
JP	5.02%	13	6	7		
BR	26.92%	67	6	5	28	28
PK	20.58%	51	6	6	20	19
WWS	9.52%	24	2	2	10	10
		250	68	67	58	57

High Zone

Date	Location	Time	N	DOW
07/02	DB	10-130	13	W
07/04	JP	130-5	12	F
07/05	EL	130-5	13	SA
07/06	JP	10-130	12	SU
07/10	DB	130-5	14	H
07/12	EL	130-5	13	SA
07/16	EL	10-130	14	W
07/20	EL	10-130	13	SU
07/23	BP	10-130	10	W
07/28	VC	10-130	13	M
08/09	EL	130-5	13	SA
08/10	EL	130-5	13	SU
08/18	DB	10-130	13	M
08/20	EL	10-130	13	W
08/22	JP	10-130	11	F
08/22	JP	130-5	11	F
08/27	VC	130-5	12	W
08/27	DB	130-5	13	W
08/28	BP	130-5	11	H
08/30	EL	10-130	13	SA

**APPENDIX 5: ESTIMATED DAILY CARRIAGE ROAD USE FROM PEGASUS
COMPUTER COUNTS FROM JUNE 4 TO OCTOBER 31, 2003 (see note next page).**

MAY	PEGTTL9- CTRTTL	DLYUSE	JUNE	PEGTTL9- CTRTTL	DLYUSE	JULY	PEGTTL9- CTRTTL	DLYUSE	2.406932
									Coefficient
1			1			1	500	1796.466	
2			2			2	500	1796.466	
3			3			3	490	1772.397	
4			4	157	970.8884	4	449	1673.713	
5			5	138	925.1567	5	474	1733.886	
6			6	138	925.1567	6	398	1550.959	
7			7	138	925.1567	7	382	1512.448	
8			8	138	925.1567	8	553	1924.034	
9			9	138	925.1567	9	390	1531.704	
10			10	263	1226.023	10	330	1387.288	
11			11	136	920.3428	11	100	833.6932	
12			12	196	1064.759	12	395	1543.738	
13			13	164	987.7369	13	370	1483.565	
14			14	164	987.7369	14	494	1782.025	
15			15	165	990.1438	15	621	2087.705	
16			16	282	1271.755	16	406	1570.215	
17			17	269	1240.465	17	237	1163.443	
18			18	269	1240.465	18	367	1476.344	
19			19	311	1341.556	19	410	1579.842	
20			20	312	1343.963	20	380	1507.634	
21			21	312	1343.963	21	589	2010.683	
22			22	312	1343.963	22	426	1618.353	
23			23	312	1343.963	23	291	1293.417	
24			24	312	1343.963	24	225	1134.56	
25			25	312	1343.963	25	591	2015.497	
26			26	312	1343.963	26	364	1469.123	
27			27	312	1343.963	27	304	1324.707	
28			28	312	1343.963	28	559	1938.475	
29			29	312	1343.963	29	632	2114.181	
30			30	404	1565.401	30	583	1996.242	
31			N=27	Total	31872.68	31	541	1895.15	
N=11	Total	0		Average	1180.47	N=31	Total	50517.95	
	Average	0					Average	1629.611	
AUGUST	PEGTTL9- CTRTTL	DLYUSE	SEPT	PEGTTL9- CTRTTL	DLYUSE	OCT	PEGTTL9- CTRTTL	DLYUSE	
1	496	1786.838	1	323	1370.439	1	104	843.321	
2			2	184	1035.876	2	51	715.7536	
3	531	1871.081	3	247	1187.512	3	198	1069.573	
4	237	1163.443	4			4	145	942.0052	
5			5	228	1141.781	5	120	881.8319	
6	391	1534.111	6	251	1197.14	6	102	838.5071	
7			7	310	1339.149	7	118	877.018	
8			8	232	1151.408	8	143	937.1913	
9			9	191	1052.724	9	156	968.4815	
10			10	227	1139.374	10	200	1074.386	
11			11	168	997.3646	11	446	1666.492	
12			12	270	1242.872	12	428	1623.167	
13	282	1271.755	13	279	1264.534	13	223	1129.746	
14	609	2058.822	14	222	1127.339	14	165	990.1438	
15	653	2164.727	15	390	1531.704	15			
16	395	1543.738	16			16	113	864.9834	
17	531	1871.081	17			17	132	910.7151	
18	631	2111.774	18	191	1052.724	18	128	901.0873	
19	616	2075.67	19	164	987.7369	19	92	814.4378	
20	687	2246.563	20	121 RACE	884.2388	20	97	826.4724	
21	578	1984.207	21	243	1177.885	21			
22	526	1859.046	22	182	1031.062	22	37	682.0565	
23	491	1774.804	23	117	874.6111	23	20	641.1386	
24	473	1731.479	24	160	978.1092	24	65	749.4506	
25	487	1765.176	25	168	997.3646	25	122	886.6458	
26	452	1680.933	26	132	910.7151	26	32	670.0218	
27	458	1695.375	27	168	997.3646	27			
28	497	1789.245	28	34	674.8357	28	24	650.7664	
29	372	1488.379	29	135	917.9359	29			
30	407	1572.621	30	101	836.1002	30	48	708.5328	
31	587	2005.869	N=27	5438 Total	29099.9	31	40	689.2773	
N=23	Total	41046.74		Average	1077.774	N=27	3549 Total	24553.2	
	Average	1784.641					Average	909.3779	

APPENDIX 5: ESTIMATED DAILY CARRIAGE ROAD USE FROM PEGASUS COMPUTER COUNTS FROM JUNE 4 TO OCTOBER 31, 2003 (CONT.)

Notes

PEGTTL9-6=Pegasus computer count 9am-6pm.

CTRTTL= Eagle Lake Trail Counter Total for 24 hours (back up-used 6/4-7/10)

DLYUSE=systemwide daily use estimate

6/4-7/2: averages used because of infrequent counter checks.

7/9-7/10: Pegasus date time set wrong, data interpreted from print outs.

Early August: loose wire problem, lost data.

9/4, 10/15,21,27, 29=rain shuts down counter.

9/16, 17: data not available or cannot be interpreted accurately from printouts (reconnecting Pegasus.)

RACE= Bar Harbor 13 mile run, no evidence of race from data!

**APPENDIX 6: ESTIMATED DAILY AND AVERAGE CARRIAGE ROAD USE FOR
JULY AND AUGUST, 1995, AND 1997 - 2003.**

July	95	97	98	99	00	01	02	03	04	05	06
1	1894	1,136		1152	1111	1076	1604	1796			
2	2758	1,495	1416	937	2273	2066	1134	1796			
3	2937	1,090	1672	1680	2036	1587	1175	1772			
4	1631	1,446	1927	1721	1721	1362	1481	1674			
5	1607	2,384	663	1359	1862	1598	2299	1734			
6	2018	1,819	1438		1862	1511	1931	1551			
7		1,476	1490		875	1294	1385	1512			
8		1,990	1432		1215	1041	1806	1924			
9	1597	924	1060	1495	1272	1111	1493	1532			
10	723	1,228	888		1011		1842	1387			
11	2125	1,606	970	1677	1688	1250	1705	834			
12	1576	1,647	1389	1634	1536	1193	1464	1544			
13	1497	1,234	1636	1680	1188	1160	1471	1484			
14	1155	1,606	1427	1808	837	1237	1366	1782			
15	1234	1,876	1226	1541	1011	1111	1650	2088			
16	1559	1,359	1258	1490	774	1130	1777	1570			
17	457	1,650	1275	1111	752	1163	1844	1163			
18	277	1,413	1492	970	546	1337	1727	1476			
19	2616	1,585	1408	1745	1642	1362	1274	1580			
20	1801	1,966	1095	1751	1555	1460	1508	1508			
21	1327	1,669	1849	1927	1296	1315	1688	2011			
22	1832		1582	1808	657	1253	1849	1618			
23	1752	2,088	1492	1509	1479	1566	1866	1293			
24	1656	1,960	1220	1392	1704	1359	2066	1135			
25	2056	1,552	1672	992	1849	1579	1609	2015			
26	1949	1,919	1606	2099	1715	1073	1633	1469			
27	1645	1,878	1759	2023	0	1484	1397	1325			
28	1358	1,884	1930	1849	891	1596	1623	1938			
29	540	2,344	1519	1775	1411	1827	1004	2114			
30	1645	2,012	1732	1525	1813		1808	1996			
31	1759		1422	1650	1802	1402	2116	1895			
TTL	46982	48236	42945	42298	41384	39505	50596	50518			
AVG	1620	1663	1431	1567	1379	1362	1632	1630			
+2000 Days	6	4	1	2	2	1	3	4			
Top Ten											
July	95	97	98	99	00	01	02	03	04	05	06
	2937	2384	1930	2099	2273	2066	2299	2114			
	2758	2344	1927	2023	2036	1827	2116	2088			
	2616	2088	1849	1927	1862	1598	2066	2015			
	2125	2012	1759	1849	1862	1596	1931	2011			
	2056	1990	1732	1808	1849	1587	1866	1996			
	2018	1966	1672	1808	1813	1579	1849	1938			
	1949	1960	1672	1775	1802	1566	1844	1924			
	1894	1919	1636	1751	1721	1511	1842	1895			
	1832	1884	1606	1745	1715	1484	1808	1796			
	1801	1876	1582	1721	1704	1460	1806	1796			
Total	21986	20423	17365	18506	18638	16274	19429	19574			
Average	2199	2042	1737	1851	1864	1627	1943	1957			

**APPENDIX 6: ESTIMATED DAILY AND AVERAGE CARRIAGE ROAD USE FOR
JULY AND AUGUST, 1995, AND 1997 - 2003 (CONT.)**

Aug	95	97	98	99	00	01	02	03	04	05	06
1	1628	1,998	1549	1460	1889	1857	2044	1787			
2	1611	1,685	1479	2066	1022	1318	1823				
3	2357	1,887	1783	2137	1389	1419	1705	1871			
4	315	2,616	2292	2205	1655	1443	1779	1163			
5	2561	1,900	2333	2107	1451	1680	2051				
6	2163		1985	1998	1530	1677	2367	1534			
7	1953		1653	1892		2072	2663				
8	2070	1,558	1593	973	3132	1756	2227				
9	1466	1,881	1547	2330	2403	1245	2006				
10	754	2,325	2069	2613	2431	1541	1917				
11	1783	2,714	1492	2316	2504	1571	1628				
12	1956	2,795	2246	1704	1710	1732	2254				
13	2198	2,512	2267	2319	1985	1549	2124	1272			
14	1970		1781	1302	1933	2142	1873	2059			
15	2084	2,229	1783	578	1626	1933	2148	2165			
16	2460		1294	2504	1609	1699	1871	1544			
17	2046	1,650	1966	2613	2811	1408	1565	1871			
18	1552	2,270	1422	2118	1802	1354	1654	2112			
19	2315		2189	2191	1751	1359	1972	2076			
20	1911	2,289	2267	1868	1198	1190	1895	2247			
21	1635		1674	1492	2017		2020	1984			
22	1770		1729	1291	2112	1941	2107	1859			
23	1514		1898	2164	1930	1606	1739	1775			
24	1604			2180	1538	1636	1565	1731			
25	1576		1688	2115	1519	1245	1139	1765			
26	1714	2,004	1642	2295	1422	1451	1447	1681			
27	1683	1,748	1503	1536	1291	1258	1676	1695			
28	1552	1,160	1367	1348	1400	1544	1775	1789			
29	1656	1,209		1136	1277	1419	1681	1488			
30	1745	1,558		1179	1095	1397	1438	1573			
31	1393	1,680		1345	1207	1125	1712	2006			
TTL	54995	41668	48489	57376	52642	46568	57865	41047			
AVG	1774	1984	1796	1851	1755	1552	1867	1785			
+2000 Days	9	9	7	16	7	2	11	6			
Top Ten											
Aug	95	97	98	99	00	01	02	03	04	05	06
	2561	2795	2333	2613	3132	2142	2663	2246			
	2460	2714	2292	2613	2811	2072	2367	2165			
	2357	2616	2267	2504	2504	1941	2254	2112			
	2315	2512	2267	2330	2431	1933	2227	2076			
	2198	2325	2246	2319	2403	1857	2148	2059			
	2153	2289	2189	2316	2112	1756	2124	2006			
	2084	2270	2069	2205	2017	1732	2107	1984			
	2070	2229	1985	2191	1985	1699	2051	1871			
	2046	2004	1966	2180	1933	1680	2044	1871			
	1970	1998	1898	2164	1930	1677	2020	1859			
Total	22214	23752	21512	23435	23259	18488	22005	20248			
Average	2221	2375	2151	2344	2326	1849	2201	2025			

APPENDIX 7: TWO-TAILED CONFIDENCE INTERVALS (60%, 80% 90%, AND 95%) FOR PREDICTED DAILY CARRIAGE ROAD USE FOR JUNE - OCTOBER 2003

In the table on the next page, please note the predicted y at a trail counter level of 1,154. Multiply the error of y for 1154 by the t table number (0.879) for 10 degrees of freedom for a 60% two tailed confidence interval – this is the same as a one tailed 80% confidence interval. The result 369.6976; subtract this from the predicted y, 3,370.48, and the answer is over 3,000. Therefore, 1,154 is the trail counter use level at which we are 80% sure that overall use really exceeded 3,000 per day.

(from charlie\carroads\data\dlyuse\2003.wb2, pages c, d, e)

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[illegible]

**APPENDIX 7: TWO-TAILED CONFIDENCE INTERVALS (60%, 80% 90%, AND 95%)
FOR PREDICTED DAILY CARRIAGE ROAD USE FOR JUNE - OCTOBER 2003 (cont.)**

Analysis of Variance							
	df	Sum of Squares	Mean Square	F	Significance F		
Regression	1	593241.6412	593241.6	18.6693	0.001511		
Residual	10	317763.2755	31776.33				
Total	11	911004.9167					
	Coefficients	Standard Error	t Statistic	P-value	Lower 95.00%	Upper 95.00%	
Intercept	592.8806	270.3342973	2.193139	0.05069	-9.461725	1195.223	
x1	2.406932	0.557057377	4.320798	0.001213	1.165731	3.648134	
Regression Statistics							
x ave	476.4167			Multiple R	0.806966		
sumx-xbar sq	102400.9			R Square	0.651195		
numb of obs	12			Adjusted R Squ	0.616314		
My x observation	1154			Standard Error	178.2592		
Predicted y	3370.481			Observations	12		
Error of y	420.5888						
Have to adjust for A25	t10		80% CI 1.372 577.0479	90% CI 1.812 762.107	95% CI 2.228 937.0719	60% CI 0.879 369.6976	
July	Obsvd x	Pred y	Error of y	80%CI	90%CI	95% CI	60%CI
1	500	1796.35	186.00	255.20	337.04	414.41	163.50
2	500	1796.35	186.00	255.20	337.04	414.41	163.50
3	490	1772.28	185.69	254.77	336.47	413.72	163.22
4	449	1673.59	186.17	255.42	337.33	414.78	163.64
5	474	1733.77	185.54	254.56	336.20	413.39	163.09
6	398	1550.84	190.61	261.52	345.39	424.68	167.55
7	382	1512.33	192.85	264.59	349.44	429.67	169.51
8	553	1923.91	190.38	261.20	344.97	424.17	167.34
9	390	1531.58	191.68	262.99	347.33	427.07	168.49
10	330	1387.17	202.67	278.07	367.25	451.56	178.15
11	100	833.57	279.99	384.14	507.34	623.81	246.11
12	395	1543.62	191.00	262.05	346.09	425.55	167.89
13	370	1483.45	194.78	267.24	352.94	433.97	171.21
14	494	1781.91	185.80	254.91	336.66	413.95	163.32
15	621	2087.59	202.27	277.51	366.50	450.65	177.79
16	406	1570.10	189.64	260.19	343.63	422.52	166.69
17	237	1163.32	228.50	313.50	414.04	509.09	200.85
18	367	1476.22	195.29	267.94	353.87	435.11	171.66
19	410	1579.72	189.19	259.57	342.81	421.52	166.30
20	380	1507.51	193.16	265.01	350.00	430.35	169.78
21	589	2010.56	195.85	268.71	354.88	436.36	172.15
22	426	1618.23	187.65	257.46	340.02	418.09	164.95
23	291	1293.30	212.35	291.34	384.78	473.12	186.66
24	225	1134.44	232.46	318.94	421.22	517.93	204.34
25	591	2015.38	196.21	269.20	355.53	437.16	172.47
26	364	1469.00	195.82	268.67	354.83	436.29	172.13
27	304	1324.59	208.92	286.64	378.57	465.48	183.64
28	559	1938.36	191.16	262.27	346.38	425.90	168.03
29	632	2114.06	204.78	280.96	371.07	456.26	180.00
30	583	1996.12	194.81	267.27	352.99	434.03	171.23
31	541	1895.03	188.99	259.30	342.46	421.08	166.13
August	Obsvd x	Pred y	Error of y	80%CI	90%CI	95% CI	60%CI
1	496	1786.72	185.86	255.00	336.78	414.09	163.37
2		592.88	323.82	444.28	586.76	721.46	284.63
3	531	1870.96	188.01	257.95	340.68	418.89	165.26
4	237	1163.32	228.50	313.50	414.04	509.09	200.85
5		592.88	323.82	444.28	586.76	721.46	284.63
6	391	1533.99	191.54	262.80	347.07	426.76	168.37
7		592.88	323.82	444.28	586.76	721.46	284.63
8		592.88	323.82	444.28	586.76	721.46	284.63
9		592.88	323.82	444.28	586.76	721.46	284.63
10		592.88	323.82	444.28	586.76	721.46	284.63
11		592.88	323.82	444.28	586.76	721.46	284.63
12		592.88	323.82	444.28	586.76	721.46	284.63
13	282	1271.64	214.83	294.75	389.28	478.65	188.84
14	609	2058.70	199.70	273.99	361.85	444.93	175.53
15	653	2164.61	210.00	288.12	380.52	467.88	184.59
16	395	1543.62	191.00	262.05	346.09	425.55	167.89
17	531	1870.96	188.01	257.95	340.68	418.89	165.26
18	631	2111.65	204.55	280.64	370.64	455.73	179.80
19	616	2075.55	201.17	276.01	364.52	448.21	176.83
20	687	2246.44	219.51	301.17	397.75	489.07	192.95
21	578	1984.09	193.98	266.13	351.48	432.18	170.50
22	526	1858.93	187.58	257.36	339.90	417.93	164.89
23	491	1774.68	185.72	254.80	336.52	413.77	163.24
24	473	1731.36	185.55	254.57	336.21	413.40	163.10
25	487	1765.06	185.63	254.69	336.36	413.59	163.17
26	452	1680.81	186.04	255.24	337.10	414.49	163.53
27	458	1695.26	185.82	254.95	336.71	414.01	163.34
28	497	1789.13	185.89	255.04	336.84	414.17	163.40
29	372	1488.26	194.44	266.77	352.33	433.22	170.91
30	407	1572.50	189.52	260.03	343.42	422.26	166.59
31	587	2005.75	195.50	268.22	354.24	435.57	171.84

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Analysis of Variance							
	df	Sum of Squares	Mean Square	F	Significance F		
Regression	1	593241.6	593241.6	18.6693	0.001511		
Residual	10	317763.3	31776.33				
Total	11	911004.9					
	Coefficients	Standard Error	t Statistic	P-value	Lower 95.00%	Upper 95.00%	
Intercept	592.8806	270.3343	2.193139	0.05069	-9.461725	1195.223	
x1	2.406932	0.557057	4.320798	0.001213	1.165731	3.648134	
Regression Statistics							
x ave	476.4167			Multiple R	0.806966		
sumx-xbar sq	102400.9			R Square	0.651195		
numb of obs	12			Adjusted R Square	0.616314		
				Standard Error	178.2592		
My x observation	1154			Observations	12		
Predicted y	3370.481						
Error of y	420.5888						
			80% CI	90% CI	95% CI	60% CI	
Have to adjust for A25	t10		1.372	1.812	2.228	0.879	
			577.0479	762.107	937.0719	369.6976	
Sept	Obsvd x	Pred y	Error of y	80%CI	90%CI	95% CI	60%CI
1	323	1370.32	204.27	280.26	370.15	455.12	179.56
2	184	1035.76	246.90	338.74	447.38	550.09	217.02
3	247	1187.39	225.29	309.10	408.23	501.95	198.03
4	0	592.88	323.82	444.28	586.76	721.46	284.63
5	228	1141.66	231.46	317.56	419.41	515.69	203.45
6	251	1197.02	224.04	307.38	405.95	499.15	196.93
7	310	1339.03	207.41	284.56	375.82	462.11	182.31
8	232	1151.29	230.14	315.75	417.01	512.74	202.29
9	191	1052.60	244.34	335.24	442.75	544.40	214.78
10	227	1139.25	231.79	318.02	420.01	516.44	203.75
11	168	997.25	252.87	346.93	458.19	563.39	222.27
12	270	1242.75	218.28	299.48	395.52	486.33	191.87
13	279	1264.41	215.68	295.91	390.81	480.54	189.58
14	222	1127.22	233.47	320.33	423.06	520.18	205.22
15	390	1531.58	191.68	262.99	347.33	427.07	168.49
16		592.88	323.82	444.28	586.76	721.46	284.63
17		592.88	323.82	444.28	586.76	721.46	284.63
18	191	1052.60	244.34	335.24	442.75	544.40	214.78
19	164	987.62	254.39	349.02	460.95	566.77	223.61
20	121	884.12	271.34	372.27	491.66	604.54	238.50
21	243	1177.77	226.56	310.85	410.53	504.78	199.15
22	182	1030.94	247.63	339.75	448.71	551.73	217.67
23	117	874.49	272.97	374.51	494.62	608.17	239.94
24	160	977.99	255.92	351.12	463.72	570.18	224.95
25	168	997.25	252.87	346.93	458.19	563.39	222.27
26	132	910.60	266.90	366.18	483.62	594.65	234.60
27	168	997.25	252.87	346.93	458.19	563.39	222.27
28	34	674.72	308.48	423.24	558.97	687.30	271.16
29	135	917.82	265.70	364.54	481.45	591.98	233.55
30	101	835.98	279.57	383.57	506.58	622.88	245.74
October	Obsvd x	Pred y	Error of y	80%CI	90%CI	95% CI	60%CI
1	104	843.20	278.32	381.86	504.32	620.10	244.64
2	51	715.63	300.97	412.93	545.36	670.57	264.56
3	198	1069.45	241.82	331.78	438.18	538.78	212.56
4	145	941.89	261.74	359.11	474.27	583.16	230.07
5	120	881.71	271.74	372.83	492.40	605.44	238.86
6	102	838.39	279.15	383.00	505.83	621.95	245.38
7	118	876.90	272.56	373.95	493.88	607.26	239.58
8	143	937.07	262.53	360.19	475.70	584.91	230.76
9	156	968.36	257.46	353.23	466.51	573.61	226.30
10	200	1074.27	241.11	330.80	436.89	537.19	211.94
11	446	1666.37	186.31	255.62	337.59	415.10	163.77
12	428	1623.05	187.49	257.23	339.73	417.72	164.80
13	223	1129.63	233.14	319.86	422.44	519.43	204.93
14	165	990.02	254.01	348.50	460.26	565.92	223.27
15	0	592.88	323.82	444.28	586.76	721.46	284.63
16	113	864.86	274.60	376.76	497.58	611.82	241.38
17	132	910.60	266.90	366.18	483.62	594.65	234.60
18	128	900.97	268.50	368.39	486.53	598.23	236.02
19	92	814.32	283.34	388.74	513.41	631.28	249.06
20	97	826.35	281.24	385.86	509.61	626.60	247.21
21	0	592.88	323.82	444.28	586.76	721.46	284.63
22	37	681.94	307.15	421.41	556.56	684.33	269.99
23	20	641.02	314.75	431.84	570.33	701.26	276.67
24	65	749.33	294.87	404.56	534.31	656.97	259.19
25	122	886.53	270.93	371.72	490.93	603.63	238.15
26	32	669.90	309.38	424.46	560.59	689.29	271.94
27	0	592.88	323.82	444.28	586.76	721.46	284.63
28	24	650.65	312.95	429.37	567.07	697.26	275.09
29	0	592.88	323.82	444.28	586.76	721.46	284.63
30	48	708.41	302.29	414.74	547.75	673.50	265.71
31	40	688.16	305.82	419.59	554.15	681.37	268.82