

Recreational Use of Selected Viewpoints on Going-to-the-Sun Road, 2005

Glacier National Park



Recreational Use of Selected Viewpoints
on Going-to-the-Sun Road, 2005
Glacier National Park

Wayne Freimund
Stephen F. McCool
John C. Adams

Department of Society and Conservation
The University of Montana
Missoula, Montana

March 2006

Acknowledgements

The data reported here could not have been collected without the close cooperation and collaboration of a number of individuals. Our field data collection team, consisting of Ariel Blotkamp, Lee Rademaker, Art Adamiec, Drew Steinburger, CharannaSmith and Kara Grau, conducted the observations and interviews with a style, sensitivity and professionalism that greatly enhanced the reliability of the data. National Park Service employees Gary Danczyk and Jack Potter provided moral support and logistical leadership in ensuring the project was implemented. Transportation intern Lisa Ballard provided important feedback on the study design and analysis of data while also being there for additional data collection and logistics support.

The data was collected from literally thousands of park visitors, people traveling the Going to the Sun Road during the summer of 2005. Without the cooperation of these park visitors the study would not have been possible.

Table of Contents

Section 1. Introduction.....	1
Section 2. General Findings	3
State of origin.....	3
Group Type.....	4
Group size	5
Use of viewpoints by direction of travel.....	7
Planned and spontaneous use of viewpoints	9
Reasons for stopping at viewpoints	9
Activity participation at viewpoints	11
Length of stay at viewpoints	12
Section 3. Profile of hikers.....	13
Relative frequency of hiking from viewpoints	13
Hike duration.....	13
Hiking to other viewpoints.....	13
Hike destinations.....	13
Overnight hikes	14
Where do overnight hikers stay?	14
Characteristics of hikers	14
Section 4. Shuttle System Data.....	17
How many viewpoint users said they would use a shuttle?	17
Is willingness to use shuttles correlated to other factors?	18
How does peak use differ from non-peak use?	19
Section 5. Viewpoint-specific data and comparison	20
How does use of different viewpoints compare in terms of direction, duration, long-term parking, and likelihood of being full?	20
Red Rock.....	24
Upper and Lower Loop.....	26
Big Bend	30
Oberlin Bend.....	32
Lunch Creek.....	34
Figure 18. Proportion of Eastward Travel by Time of Day for Lunch Creek.....	35
Siyeh Bend	36
Upper and Lower Jackson.....	38
Figure 20. Proportion of Eastward Travel by Time of Day for Upper Jackson	39

St. Mary Falls	40
Sunrift Gorge.....	42
Figure 22. Proportion of Eastward Travel by Time of Day for Sunrift Gorge.....	43
Wild Goose Island	44
Appendix: Methods	46
Interview Instrument.....	48

Executive Summary

The purpose of the study was to examine recreational use of selected viewpoints (13) along the Going to the Sun Road in Glacier National Park in order to inform the development of an intelligent transportation system to be used in mitigating consequences of the reconstruction of the road. The study involved both observing visitor behavior and use of the selected viewpoints and interviewing visitors. Viewpoints were systematically randomly sampled in two hour blocks over the period of June 29 to August 30. All visitors stopping during the two hour observation period were recorded and a subsample of those was interviewed. Variables measured included length of stay, group size, residence, activity participation, reason for stopping at the viewpoint and potential use of a proposed shuttle bus.

Because only 13 viewpoints were selected, the data is heavily influenced by the viewpoints included. Duration of stop, for example, may have been different had areas such as Logan Pass and Avalanche Lake been included in the study. Further, aggregating the data obscures important differences between use and characteristics of those using varying viewpoints.

Visitor Profile

Nearly one in every seven of those who used the selected viewpoints on Going-to-the-Sun Road was from Montana. Three out of every four groups included family members. Nearly half the visitors stopping at the viewpoints were in groups of two. Less than half the surveyed visitors were spending any nights in Glacier National Park. Overall, 54% of travelers were traveling eastward; early and late in the day, overall traffic trended slightly westward.

Reasons for Stopping

The study attempted to determine why visitors stop at viewpoints. Nearly two out of three study respondents had stopped (at least in part) for the view; nearly half stopped to take a picture. Approximately one in ten visitors stopped (at least in part) to take a break for the driver, kids, or a pet. In the aggregate, 37% of stops at the selected viewpoints were planned ahead of time, while 63% were unplanned. The likelihood of having planned a stop increased with the number of nights spent in Glacier, with Montana residence, and with interest in a hike starting from the viewpoint.

The duration of stops at the viewpoints varied widely, with medians ranging from four minutes at Road Camp to 43 minutes at St. Mary Falls. In general, however, most stops were brief. Aggregated, the median stop time was a mere eight minutes, and 71% of stops were shorter than 15 minutes.

Hikers

Interviews included a number of questions concerning hiking. Approximately one in ten viewpoint visitors took hikes. Montanans were 25% more likely to plan to hike than the average visitor. Respondents traveling with friends in groups of three to five, and spending multiple nights in Glacier National Park, were more likely to hike than others. The median intended hike time was 2.5 hours, and only one in four hikers intended to foray for longer than five hours. Few

hikers (6.4%) left a car elsewhere for pick-up; only 1.7% planned to hike overnight. 21% of overnigheters intended to stay in a chalet; 69% intended to stay in a campground.

Shuttle Bus System

Interviews included a number of questions designed to gauge interest in a shuttle bus system. Seventy percent of respondents indicated that they were likely to use a free shuttle bus system operating on the half-hour; 63% indicated that they were likely to use such a shuttle bus system costing \$5 round trip. (It is likely that the actual number of visitors who would use a shuttle system when confronted with the tradeoffs in making such a decision is significantly less than this.)

Viewpoint-by-Viewpoint data

Use of the viewpoints varied significantly. For example, use of the St. Mary Falls viewpoint was motivated to a significant extent by interest in the hike there. Road Camp, on the other hand, was used primarily as a utility stop. Findings for each viewpoint are summarized in Section 4 of this report.



Section 1. Introduction

Purpose of the Study

The reconstruction of the Going to the Sun Road (GTSR) poses important questions about impacts on visitor behavior, use levels, and patterns of use within Glacier National Park, both during and following the construction activity. As now scheduled, the construction will take place over a seven to eight year period, and while the road will not be completely closed during this time, visitors may experience significant time delays and changes in access to popular trailheads and scenic overlooks. The Record of Decision for the Reconstruction Environmental Impact Statement indicates that maintaining visitor access and minimizing travel delays are key issues.

A goal of the intelligent transportation system is to minimize disruptions to visitors in the short run while reducing impacts on park values in the long run. These goals will be achieved through changes in road design, improved parking, restoration of some view points, development of a shuttle bus system, use of intelligent transportation systems and other actions. To effectively mitigate impacts, more information is needed regarding existing visitor behavior and levels and patterns of use on GTSR. This information will enhance the efficacy of mitigation efforts and enable comparison of impacts against a clear baseline.

Description of the Study

The research described here was designed to provide a baseline of information that will allow park managers to plan improvements associated with reconstruction and mitigate unforeseen impacts to visitor experiences, park values, and key biophysical attributes. The primary objective was to characterize user type and distribution at 13 viewpoints along the GTSR: Road Camp, Red Rock, Upper Loop, Lower Loop, Big Bend, Oberlin Bend, Lunch Creek, Siyeh Bend, Upper Jackson, Lower Jackson, St. Mary Falls, Sunrift Gorge, and Wild Goose Island (see Figure 1 for a map of GTSR viewpoints). To achieve this, each viewpoint was systematically randomly sampled during the time June 29-August 26, 2005. The sampling process was designed to sample viewpoints at varying times during the day (from 8 AM to 8 PM), for a two hour period. Over the entire summer sampling period, each viewpoint was sampled multiple times during each two hour period.

The data collection method used two principal approaches or components. The first component was observation: study team members observed and recorded information regarding the characteristics and behavior of visitors at each viewpoint during the preselected two hour sampling period. The second component involved interviewing visitors at each of the viewpoints. The results of this research provide a rich source of data regarding the nature of viewpoint use on GTSR, such as the average duration of viewpoint stays, principal activities at viewpoints, and willingness to use a proposed shuttle system. The Appendix includes a detailed description of study methods.

It is important to remember that this study reports on only a select sample of viewpoints. Had the sample been different—including, for example, sites like Avalanche or Logan Pass—the aggregate results may have been different. Accordingly, the aggregate results should not be

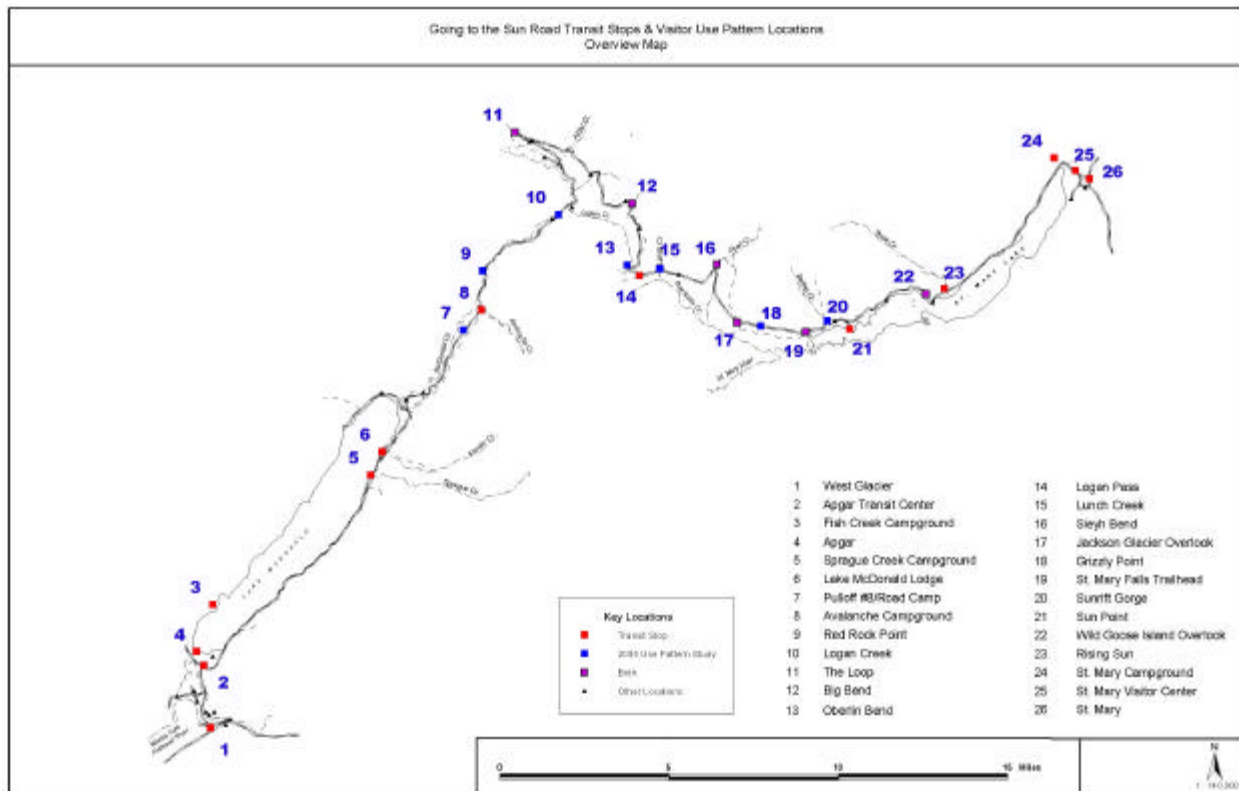


Figure 1. Location of viewpoints and pullouts along the Going to the Sun Road. The study results reported here used a subsample of these sites (see text for locations).

generalized to other GTSR viewpoints. Further, aggregating the data obscures important differences in the way each viewpoint is used.

Organization of the Report

Because the observation and interview data sets complement each other, they are not separated in this report. Instead, the report is arranged thematically. The report is divided into five main sections. Following this section the next (Section 2) section reports general, aggregated results of the study, such as the state of origin of visitors, the number of passengers per vehicle, etc. The third section explores the characteristics of visitors who hike from the selected viewpoints. The fourth section addresses data directly relevant to the development of a transit system on GTSR. The fifth section compares viewpoint-by-viewpoint findings and profiles each viewpoint included in the study. The Appendix describes research methods.

Section 2. General Findings

This section of the report gives an overview of aggregated results, such as the median duration of all stops at viewpoints, the percentage of viewpoint users who engage in particular activities, etc. Again, readers are cautioned that the selection of viewpoints heavily influenced aggregate results.

State of origin

Interview respondents were asked their point of origin (this analysis excludes those who failed to answer the question). Additionally, the state or province listed on the license plates of vehicles observed at viewpoints was noted.¹

Table 1. State of origin of interview respondents

Rank	State	Percent
1	Montana	15.4%
2	California	7.2%
3	Washington	6.4%
4	Minnesota	4.6%
5	Alberta	3.8%
6	Illinois	3.8%
7	Florida	3.5%
8	Texas	3.5%
9	Oregon	2.7%
10	Idaho	2.5%
	Ohio	2.5%

Approximately one in seven visitors who used the selected viewpoints was from Montana.

Table 2. State of Origin of Vehicles Observed at Viewpoints

Rank	State	Percent of Observations
1	Montana	29.3%
2	Washington	9.3%
3	Alberta	6.2%
4	California	5.9%
5	Idaho	5.7%
6	Minnesota	3.4%
7	Oregon	3.1%
8	Utah	2.9%
9	Colorado	2.8%
10	Texas	2.1%

Observed origins for Montana and Alberta were roughly twice as great as reported origins. The discrepancy may have been caused by rental car license plates.

¹ According to the Glacier National Park 2002 Survey of Visitors (p. 8), 20% of surveyed visitors in 2000 were Montana residents; in 2002, 14% of surveyed visitors were Montana residents. The proportional origin of other visitors is roughly consistent with the 2002 and 2000 surveys of visitors (Glacier National Park 2002 Survey of Visitors (p. 22)).

Group Type

Interview respondents were asked to characterize their group type as friends, family, family & friends, or alone.

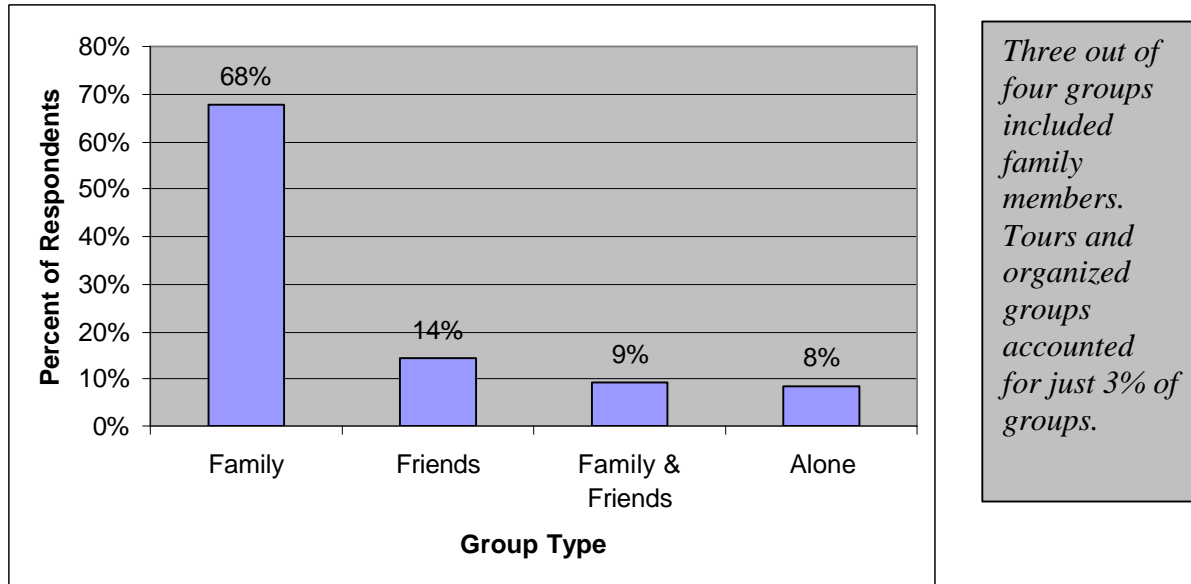


Figure 2. Group type of interviewed respondents

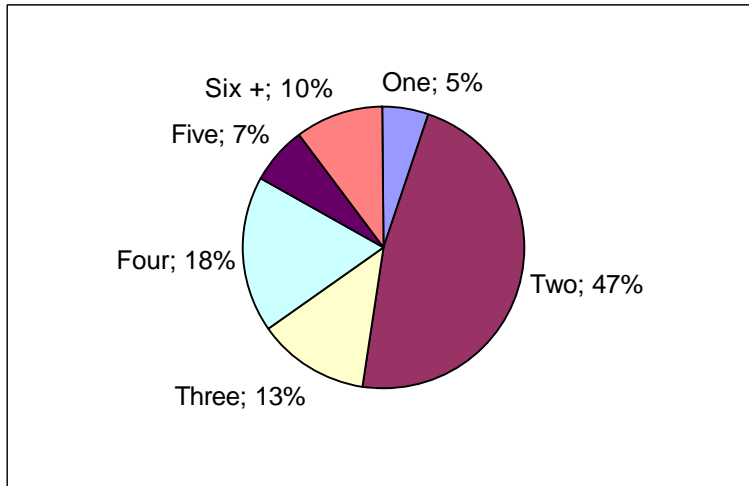
Respondents were subsequently asked to identify whether their group was part of an organized group or tour. Just 2% said they were part of an organized group, and 1% said they were part of an organized tour.

Observation of group type tracked closely with interview results.² However, the observation data indicated a significant difference in the direction of those traveling alone. Those traveling alone comprised 4.3% of parties traveling eastward, but 8.6% of the parties traveling westward.

² These results are also within a few percentage points of results from the Glacier National Park 2002 Survey of Visitors (p. 23).

Group size

Interview respondents were asked the size of their group.³ The median party size was 2; the mean party size was 3.24.⁴



More than half the interview respondents were traveling alone or with only a single companion.

Figure 3. Distribution of group sizes interviewed



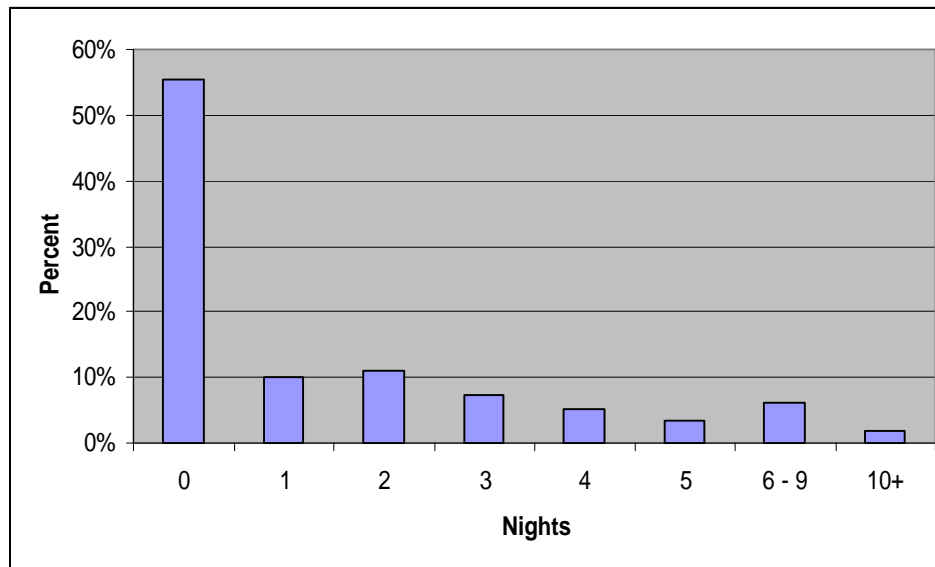
Minimizing traffic congestion during construction is a major goal of the intelligent transportation system

³ The maximum group size respondents could mark was “10.”

⁴ According to the Glacier National Park 2002 Survey of Visitors (p. 8), mean party size of surveyed visitors in 2000 was 2.83 people; in 2002 it was 3.47 people.

Length of stay in Glacier National Park

Interview respondents were asked how many nights they intended to stay in Glacier National Park. Visitors spent a mean of 1.52 nights inside the park.⁵



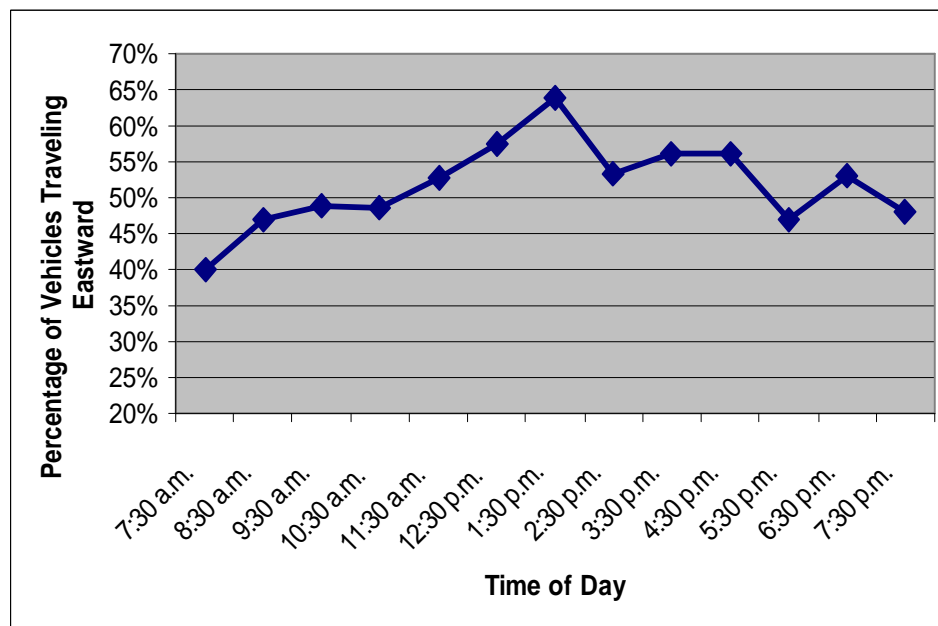
More than half of all respondents did not intend to spend a single night in Glacier National Park.

Figure 4. Length of stay in Glacier National Park of sampled respondents

⁵ According to the Glacier National Park 2002 Survey of Visitors (p. 13), surveyed visitors in 2002 spent a mean of 3.1 nights in the Glacier National Park area.

Use of viewpoints by direction of travel

Observers noted the direction of travel of vehicles that stopped at viewpoints. Overall, 54% of those who stopped at viewpoints were traveling eastward. Generally, 51.2% of all traffic on Going-to-the-Sun Road is eastbound (based on widely spaced traffic counts from July 12-25, 2002).⁶



From approximately 11:30 a.m. until 5:30 p.m., more than half of all traffic was eastward. Early and late in the day, more than half of all traffic was westward.

Figure 5. Percentage of travel observed traveling east by time of day

⁶ Personal Communication. Lisa Ballard, Glacier National Park Transportation Scholar. December 27, 2005.

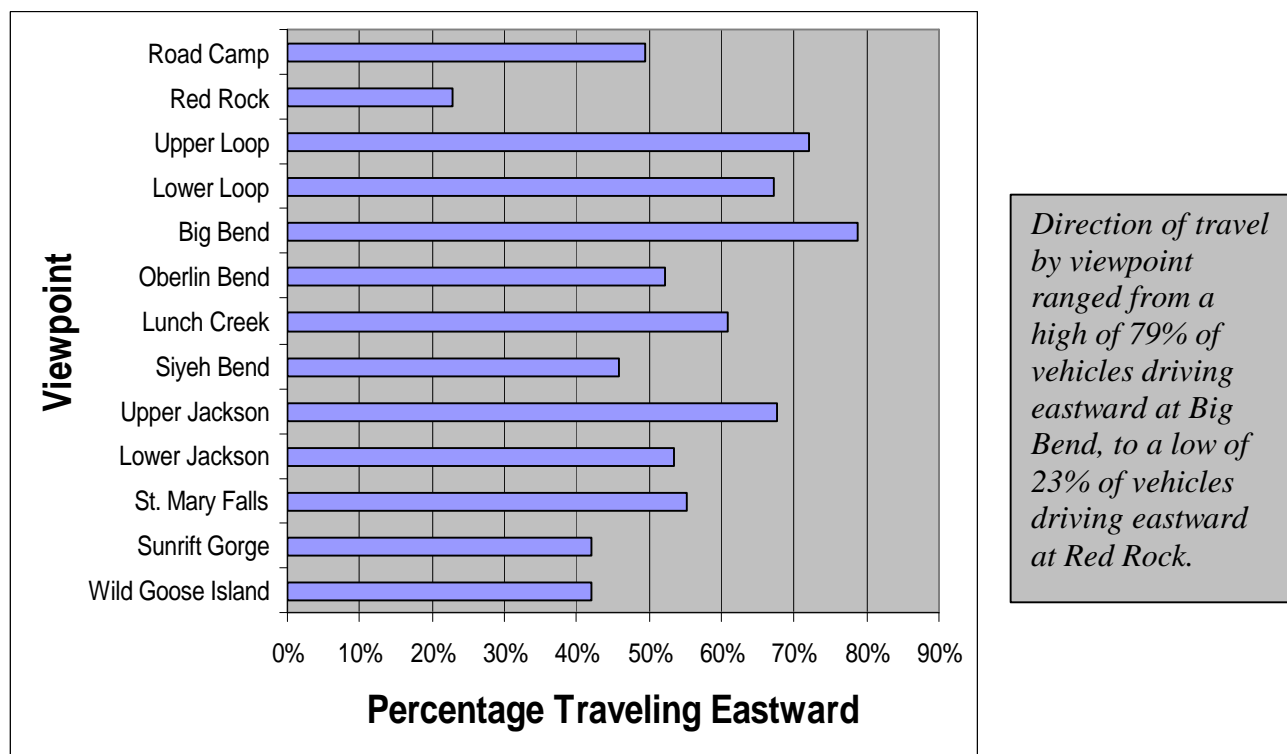


Figure 6. Percentage of viewpoint traffic flowing eastward when stopping

Direction of travel of viewpoint users by time of day trends eastward from approximately 11:30 a.m. until 5:30 p.m. This data is consistent with the Glacier National Park Traffic and Parking Statistics Report,⁷ which found that “traffic on Going-to-the-Sun Road just west of Logan Pass peaks between noon and 4 p.m. There is more traffic going in the eastbound direction until 2 p.m., then traffic going westbound surpasses the eastbound traffic. This pattern makes sense given that a majority of those going to Logan Pass are coming from the west side of the park.” See viewpoint-by-viewpoint profiles later in this report for direction of travel by time of day by viewpoint.

Note: mean direction for time of day is based on full hours surrounding the identified times. Thus, traffic from 7 a.m. until 7:59 a.m. is aggregated at 7:30 a.m.

⁷ Law, Susan. 2003. Glacier National Park Traffic and Parking Statistics Report, 2002 Season. Glacier National Park. p. 15.

Planned and spontaneous use of viewpoints

Interview respondents reported that 37% of stops at the selected viewpoints were planned, while 63% were unplanned.⁸ Those who planned their use of viewpoints generally met intuitive preconceptions. For example, those visitors who spent zero or one night in GNP were less likely to have planned a viewpoint stop than those who spent two or more nights in GNP. Those who reported that they stopped at a viewpoint because “Hike Starts Here” planned their viewpoint use 82% of the time, versus the mean of 34%. And finally, 51% of Montana respondents planned their viewpoint use. It may be the case that visitors who plan their stops will find use of the proposed shuttle system more congenial than visitors who don’t. We note, however, that those who planned their stops were not more likely than others to express a willingness to use a \$5 shuttle.

37% of stops at the selected viewpoints were planned; however, hikers planned their stop at the viewpoints 82% of the time.

In summary, the visitor who is more likely to have planned use of a viewpoint is a Montana resident, is spending three or more nights in Glacier National Park, is traveling westward in a group of three or more, and/or stopped for a hike.

Reasons for stopping at viewpoints

Interview respondents were asked to select up to three reasons why they had stopped at a viewpoint; “other,” with a request for specification, was one option. Of the reasons identified, “View from the Viewpoint,” selected by two-thirds of respondents, and “To Take a Picture,” was selected by one-half the respondents, were by far the most popular. “Hike Starts Here” accounted for nearly one in six stops at the selected viewpoints. Respondents were asked to select from 14 reasons for stopping; respondents offered 21 additional reasons for stopping after selecting “other.” Reasons cited by 2% or less of respondents are *not* included in Figure 7.

⁸ Excludes those who refused the interview or did not answer the question.

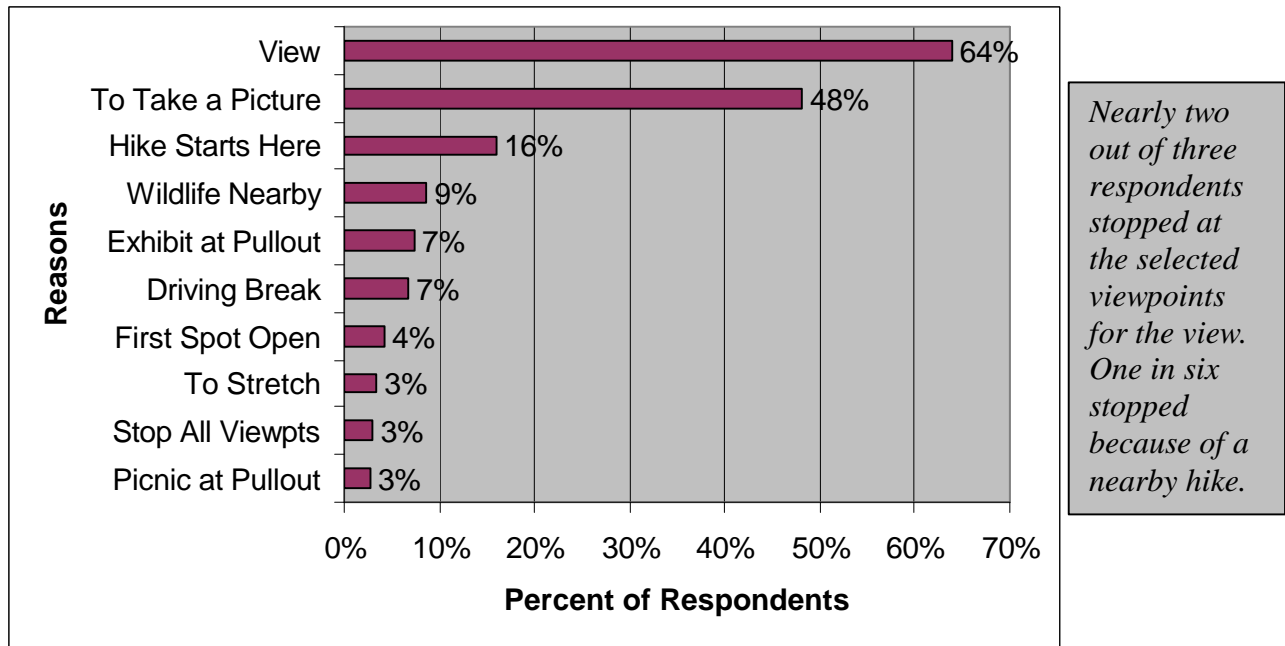


Figure 7. Reasons given for stopping at a viewpoint

Excluding the top three reasons selected—the view, photographs, and hiking—most of the reasons cited by 1% or more of respondents fell into three broad categories, as summarized in Table 3.

Table 3. Additional reasons for stopping at a viewpoint

	Percent citing	Category Total ^a
<i>Attractions</i>		19%
Wildlife Nearby	9%	
Exhibit at Pullout	7%	
Water/Waterfalls ^b	2%	
See Snow	1%	
<i>Break</i>		12%
Driving Break	7%	
To Stretch	3%	
Kids Needed a Break	2%	
Pet Needed a Break	1%	
<i>Recommended</i>		5%
Stop All Viewpoints ^{bc}	3%	
Other Stopped Cars ^b	1%	
Suggested Stop ^b	1%	

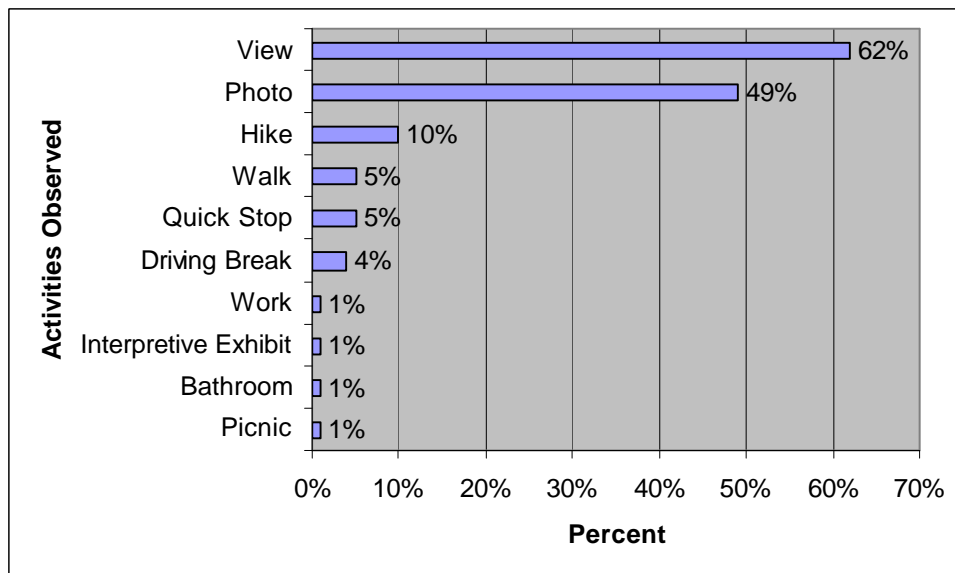
^a Because respondents could check up to three reasons, the category sum may be overstated.

^b These reasons were cited under "other;" accordingly, they are likely underreported.

^c This is included under this category under the theory that the existence of the viewpoint functions itself as a recommendation -- that is, drivers assume that every viewpoint must offer something.

Activity participation at viewpoints

The behavior of visitors at viewpoints was noted in the observation component; multiple activities were noted for visitors when appropriate. Activities engaged in by less than one percent of observed viewpoint visitors are not included in Figure 8.



Consistent with the interview findings, the three most popular activities observed at viewpoints were enjoying the view, taking photographs, and beginning hikes.

Figure 8. Observed participation in recreation activities at studied viewpoints

Length of stay at viewpoints

Based on observations, the mean duration of a stop at the selected viewpoints, aggregated, was 21 minutes.⁹ The median duration of a stop at the selected viewpoints was 8 minutes. Both the median and distribution of stop durations varied greatly by viewpoint; readers are referred to Section 5 of this report for more detail.

Table 4. Length of stay, in minutes

Duration in Minutes	Percent of Vehicles
< 5	31
5 to 15	40
16 to 40	14
> 40	15

71% of stops at the selected viewpoints were 15 minutes or less.

⁹ Observation periods were approximately 2 hours. To calculate mean parking duration when vehicles were already parked upon arrival of a study team, the study team arrival time was substituted; when vehicles were still parked upon departure of a study teams, the study team departure time was substituted. Accordingly, the mean is understated. The median and distribution of stop durations (as illustrated in Table 4) should be relatively unaffected by the limited duration of study times.

Section 3. Profile of hikers

Relative frequency of hiking from viewpoints

The study measured number of hikers in several different ways. First, observations indicated that approximately 10% of viewpoint visitors took hikes. Second, interview respondents were asked to mark reasons that they stopped at a particular viewpoint; 16% cited “Hike Starts Here.” Finally, interview respondents were explicitly asked whether they planned to hike (or were returning from a hike) at the viewpoint; 6% answered affirmatively. The discrepancy between interview responses likely stems from respondents’ opportunity to list multiple reasons for having stopped at a viewpoint—it seems likely that some visitors stop at viewpoints because they are trailheads without having decided whether or not to hike at that location.

Somewhere between six and 16 percent of those who stopped at the selected viewpoints hiked.

Hike duration

According to interview respondents, the mean intended¹⁰ hiking time was 4 hours. The median intended hike time was 2.5 hours. 75% of hikes were intended to last 5 hours or less.

Half of all hikers intended to take a hike lasting two-and-a-half hours or less.

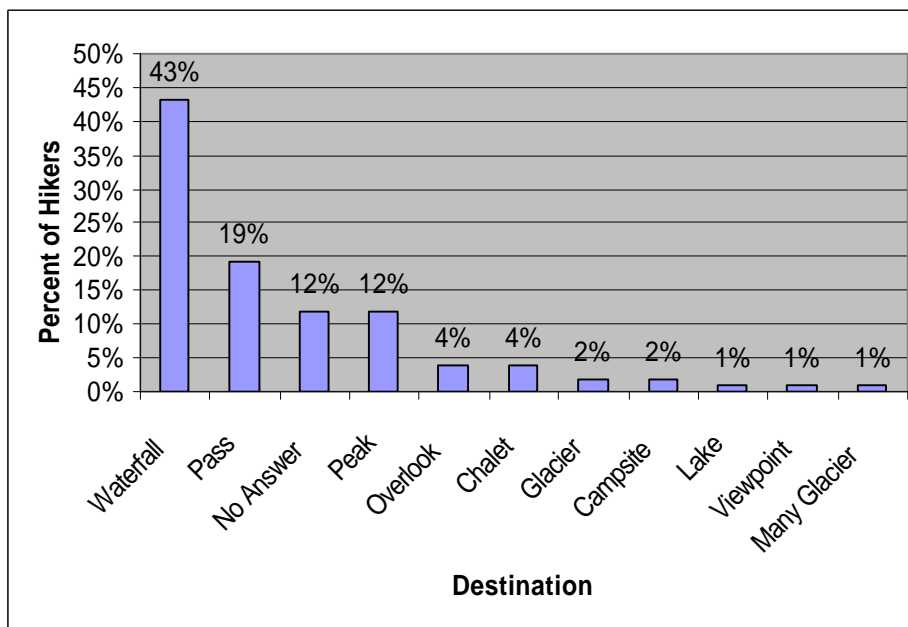
Hiking to other viewpoints

Interview respondents who stated that they planned to hike were asked whether they had left another car elsewhere: only 6.4% of hikers had done so. Study members noted that some hikers hitch-hiked back to their lone car, rather than using two cars.

Hike destinations

Those who indicated that they planned to hike were asked their destination, as described in Figure 9. It is important to remember that these aggregate numbers are largely the consequence of the viewpoints selected for study—for example, the most popular hiking trailhead that was also a selected viewpoint is St. Mary Falls, and the waterfall was identified as the most popular hiking destination.

¹⁰ Hikers were intercepted both before and after hikes; because a significant portion of the hike times were intended, rather than experienced, we refer to them as intended times here.



Waterfalls were by far the most popular destination of hikers—a pattern largely driven by the selection of viewpoints for the study.

Figure 9. Destinations indicated by those hiking from studied viewpoints

Overnight hikes

Of those who planned to hike, only 1.7 % planned to overnight in the backcountry.

Where do overnight hikers stay?

Interview respondents that intended to overnight were asked whether they would do so in a chalet or a campground. The number of respondents answering this question was very low (n = 29). Further, the viewpoints selected for study heavily influenced overnight destinations. Accordingly, this data should be interpreted with caution.

Table 5. Destinations indicated by overnight hikers

	Percentage of Overnighthers Utilizing
Chalet	21%
Campground	69%

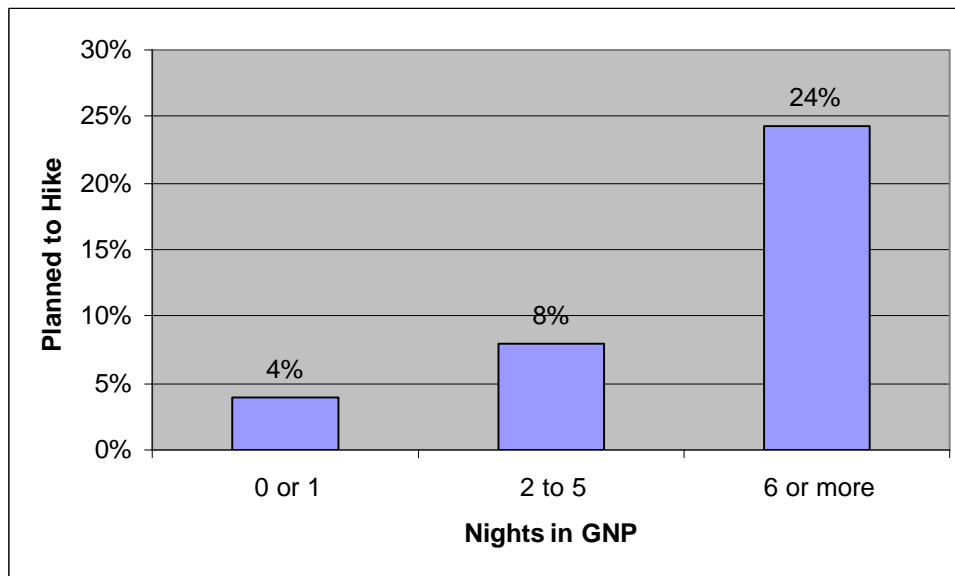
Note: Respondents were asked to check all applicable.

Characteristics of hikers

As noted previously, 6 percent of those who stopped at the selected viewpoints indicated that they planned to take a hike from the viewpoint. Respondents who indicated that they were

traveling alone were disproportionately unlikely to indicate that they planned to hike (2%), while respondents traveling with friends were disproportionately more likely to have planned a hike (16%).

Respondents who planned to hike were disproportionately likely to be spending multiple nights in Glacier (see Figure 10 below). Respondents who planned to hike were disproportionately likely to be part of a group of 3 to 5 (see Figure 11 below).



Not surprisingly, the more nights respondents were staying in GNP, the more likely they were to have planned a hike from the viewpoint.

Figure 10. Likelihood of hiking by length of stay in Glacier National Park

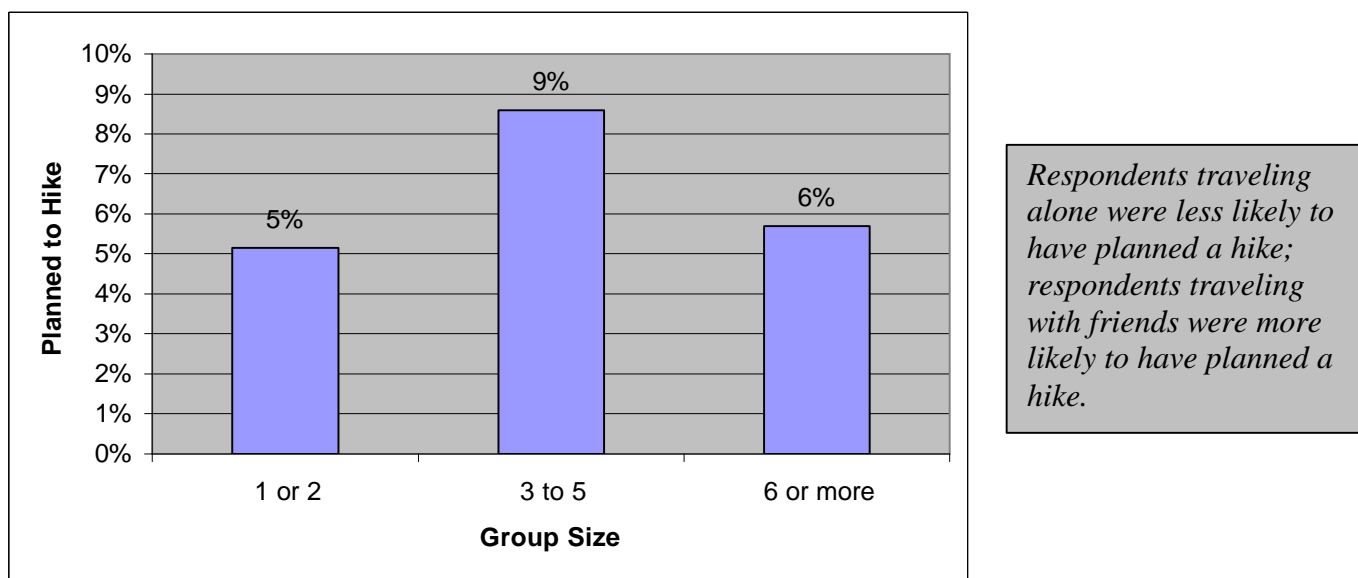


Figure 11. Planned hike before reaching viewpoint by group size

Because relatively few respondents came from any particular state, it is difficult to read too much into the fact that no Idaho residents (out of 42 respondents) planned to hike from the respective viewpoints, 3.1% of Albertans planned to hike (out of 64), while 6.5% of Washingtonians planned to hike (out of 108). Still, it is notable that 8.5% of Montanans (out of 258) indicated a plan to hike, as opposed to the 6% average.

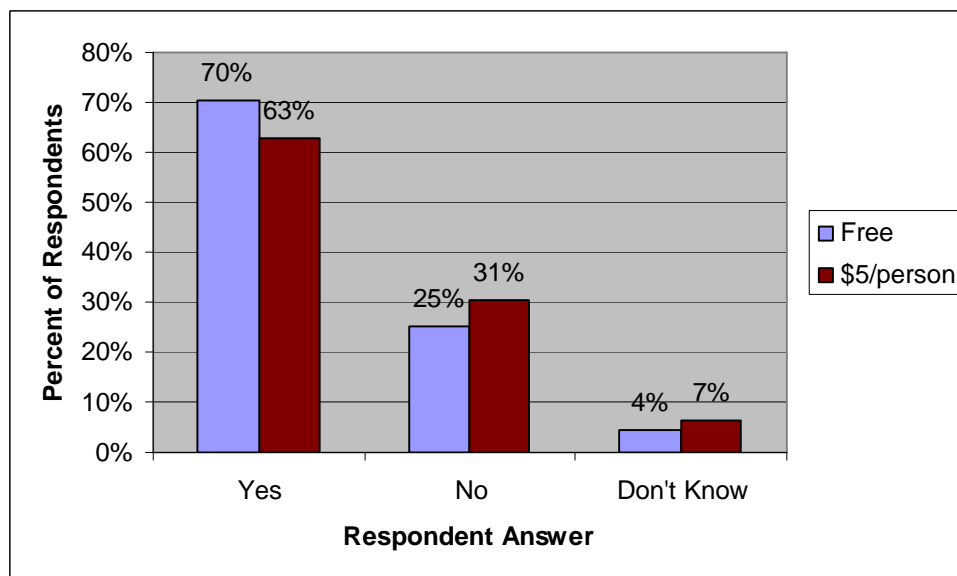
As noted previously, another measure of interest in hiking was the opportunity for respondents to indicate that “hike starts here” was one reason they stopped at a viewpoint. Analysis of this data gives relatively similar information, e.g., respondents from party sizes of 3 were the most likely to have marked “hike starts here.” Interestingly, however, Montanans and Idahoans were significantly more likely than others (24.4% and 26.2% of respondents from those states, respectively, vs. a mean of 16% of respondents) to have indicated that they stopped because “hike starts here”; this may in part simply be a reflection of knowledge, as regional “locals” are more likely to know about potential hiking opportunities even if they haven’t decided to take one. No other differences by state seem significant.

Section 4. Shuttle System Data

While much of the information in this report is relevant to transit planning, this section addresses some of the gathered data that would directly inform development of a transit system. In general, interview respondents evidenced great interest in a shuttle bus system. However, the general and hypothetical nature of the question make it impossible to draw solid conclusions about likely shuttle use—instead, this data only indicates a high level of interest in the idea. As discussed below, the profile of visitors stating that they would likely take the shuttle differed only slightly from those stating that they would be unlikely to take the shuttle. Readers are reminded that the selection of viewpoints sampled may affect this data—in other words, interviewing respondents at high-volume attractions such as Avalanche or Logan Pass might have yielded different results.

How many viewpoint users said they would use a shuttle?

Interview respondents were asked: “Would you be willing to take a free shuttle bus leaving every ½hr over the GTTSR (round trip)?” Respondents could mark “Yes, Likely,” “No, Unlikely,” or “Don’t Know.” As a follow-up question, respondents were asked “What if the experience was \$5 per person (round trip).” Response was not dramatically affected by the nominal charge. During the Glacier National Park 2002 Survey of Visitors (p. B – 11), visitors were asked a slightly different question about shuttle use. Approximately 61% said they would use a shuttle, 24% said they would not, and 15% said they did not know if they would use it.



70% of viewpoint visitors said they would likely use a free shuttle on GTTSR.

Figure 12. Expressed interest in taking a shuttle by hypothetical cost

Is willingness to use shuttles correlated to other factors?

Relationships between willingness to use the shuttle and other data points are not particularly strong, although certain types of visitors were more likely than others to ride a shuttle. First, solitary travelers are significantly less likely to believe they would use the \$5 shuttle system.¹¹ Second, those who were traveling with family and friends were more likely to intend to use the shuttle system. These relationships and others are considered below.

Willingness to take shuttles on GTSR was only weakly related to other factors.

State of Origin

Reviewed against state of origin, preliminary analysis reveals no identifiable regional distinctions—even Montanans were no more or less likely than others to have stated that they would likely use the shuttle system. The one apparent exception is Albertans, of whom only 42% said they were likely to use a shuttle system, and 55% said they likely wouldn't use a shuttle system.

Viewpoint

Typically, the viewpoint at which respondents were interviewed made little difference in their likelihood to use a shuttle. The significant exceptions:

- 1) Respondents were less likely to say “Yes” at Sun Rift Gorge, Lunch Creek, and Siyeh Bend.
- 2) Respondents were less likely to say “No” at Upper Jackson Overlook.
- 3) Respondents were more likely to say “No” at Lunch Creek.

Reasons for Stopping

In many cases, too few respondents identified a given reason for stopping to yield reliable data. Most others did not reveal significant differences with the mean. For example, among those who said they had stopped at a viewpoint because “Hike Starts Here,” 66% said they would likely use the shuttle; 62% of those who did not stop for “Hike Starts Here” said they would likely use the shuttle.

Party Size

Groups of one were significantly less likely to say yes (55% vs. 63% mean). There was no discernible pattern to likelihood of having said yes compared to other party sizes. For example, groups of three said that they would likely use the shuttle system 58% of the time, while groups of four said they would likely use the shuttle system 68% of the time. Large groups (six or more) were no more or less likely to say “Yes.”

Planned vs. Unplanned Stops

Whether respondents planned or did not plan their use of the viewpoint made no significant difference in likelihood to use the shuttle.

¹¹ Because the \$5 shuttle answer was more discriminating, all correlations were checked against stated likelihood of using a \$5 shuttle.

Group Type

Under group type, those who stated that they were alone were less likely to say “Yes” than the average respondent (56%), as were those who were traveling with friends (57%). Those who marked family and friends were more likely than the average to say “Yes” (67%). Membership in an organized group made little difference in response; membership in an organized tour had too small a sample size for reliable results.

Direction of Travel

Direction of travel made no real difference in stated likelihood to take a shuttle.

How does peak use differ from non-peak use?

One way to minimize congestion is to temporally redistribute use away from peak times. Accordingly, we considered whether travel time of viewpoint users was correlated to other factors. Defining the peak travelers as any interviewed between 11:00 a.m. and 4:59 p.m., there were no significant differences between these subgroups in terms of whether respondents’ stops were planned or unplanned, or in terms of respondents’ stated likelihood of utilizing a \$5 shuttle bus.

There were few differences between those who used viewpoints early or late in the day, and those who used viewpoints during peak traffic hours.

Two differences were notable. First, 9.4% of *nonpeak* respondents planned to hike or had hiked from the viewpoint, as opposed to 5.1% of *peak* time respondents. This discrepancy stems almost entirely from respondents interviewed prior to 11:00 a.m., of whom 11.5% stated that they planned to hike from the viewpoint; only 5.6% those interviewed after 4:59 p.m. planned to hike.

11.5% of respondents interviewed before 11:00 a.m. planned to hike from a viewpoint, compared to 5.1% of respondents interviewed between 11:00 a.m. and 4:59 p.m.

Second, those who spent zero nights in Glacier National Park made up 57.4% of *peak* respondents, as opposed to 49.7% of *nonpeak* respondents. In other words, those who spent zero nights in Glacier National Park were more likely to be traveling during peak hours.

Section 5. Viewpoint-specific data and comparison

In this section, the viewpoints are first compared along a number of dimensions related to type and length of use (Table 6). Because the use of viewpoints as hiking trailheads appears to be a significant factor in determining patterns of use, Table 7 compares interest in and intention to hike at the various viewpoints. Subsequently, each viewpoint is profiled.

How does use of different viewpoints compare in terms of direction, duration, long-term parking, and likelihood of being full?

Table 6. Summary Viewpoint Turnover Data

Viewpoint	Median Stop Duration (mins)	Mean Stop Duration (mins.) ^a	Observations	Observations	Observations	People per peak hour ^{de}	Vehicles Driving Eastward	Planned to Stop
			Not Encom- passed by Obs. Period ^b	When Lot Full ^c	When Lot Full During Peak Hours ^{cd}			
Road Camp	4	5.5	20%	3%	7%	10	49%	10%
Red Rock	10	11.7	24%	4%	7%	61	23%	21%
Upper Loop	8	5.6	36%	36%	41%	45	72%	41%
Lower Loop	7	6.4	32%	14%	19%	43	67%	39%
Big Bend	5	6.4	13%	0%	0%	62	79%	19%
Oberlin Bend	12	12.2	28%	32%	54%	45	52%	30%
Lunch Creek	8	9.9	27%	1%	2%	39	61%	26%
Siyeh Bend	17	5.8	53%	27%	39%	31	46%	50%
Upper Jackson	4	4.5	7%	2%	3%	95	68%	35%
Lower Jackson	16	6.8	54%	0%	0%	15	53%	38%
St. Mary Falls	43	21.8	70%	34%	44%	37	55%	67%
Sunrift Gorge	13	13.5	37%	9%	11%	43	42%	43%
Wild Goose Island	5	5.8	10%	0%	0%	58	42%	33%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to (should be greater than) the amount of real time that the lot is full.

^d Peak hours included the whole of any observation period for which more than 75% of the study period was between 10 a.m. and 4 p.m. for Road Camp and Red Rock, between 11 a.m. and 5 p.m. for all other viewpoints.

^e This calculation assumes that study periods are, on average, 2 hours.

**Table 7. Interview Respondents'
Interest
in Hiking, by Viewpoint**

Viewpoint	Respondents Stopping Because "Hike Starts Here"	Respondents Who Planned to Hike From the Viewpoint
Road Camp	0%	0%
Red Rock	0%	0%
Upper Loop	24%	13%
Lower Loop	18%	2%
Big Bend	2%	1%
Oberlin Bend	3%	2%
Lunch Creek	7%	1%
Siyeh Bend	43%	24%
Upper Jackson	6%	0%
Lower Jackson	26%	12%
St. Mary Falls	72%	25%
Sunrift Gorge	16%	10%
Wild Goose Island	1%	0%

Road Camp

Road camp was lightly used (only 10 people per hour during peak hours); most stops were short, with a median stop length of just four minutes; and few who stopped there (10%) had planned to do so. The study team offered a few anecdotal observations of visitor behavior:

- ? People coming from the west might stop for one picture.
- ? People coming from the east just stopped for practical reasons, not the view.
- ? It's a utility stop, in and out for most people.

Table 8. Road Camp: Summary Viewpoint Data

Parking Data		
	Median Duration of Stops (mins.)	4.0
	Mean Duration of Stops (mins.) ^a	5.5
	Percent of Observations Exceeding Observation Period	20%
	Percent of Observations During Which the Lot Was Full ^c	3%
	Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	7%
Visitor Data		
	Mean Group Size (people)	2.4
	People Using the Viewpoint During Peak Hours (per hour) ^{de}	10.0
	Percent of Observed Visitors Driving Eastward	49%
	Percent of Visitors Who Planned to Stop There	10%
Top Five Activities Observed During Stop^f		
	Take Photograph	29%
	Driving Break	20%
	View	18%
	Quick Stop ^g	17%
	Take a Walk	14%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 10 a.m. and 4 p.m.

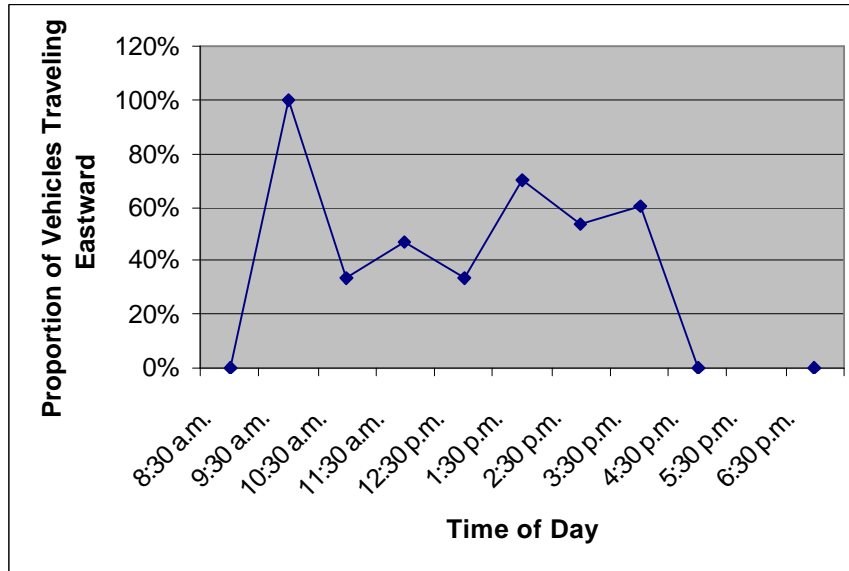
^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically do not exit their vehicle.

**Table 9. Road Camp:
Duration of Stops**

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	55%
5 to 15	26%
16 to 40	5%
> 40	14%



This figure is presented for consistency with other viewpoint profiles. However, the small number of visitors at Road Camp renders meaningful interpretation difficult.

Figure 13: Road Camp: Proportion of Eastward Travel by Time of Day of Road Camp

Red Rock

The study team observed that Red Rock was lightly used in the morning, but that during peak hours (once the sun reached the spot) use was substantial. Indeed, Red Rock accommodated 61 people per hour during peak hours. The team noted that people from traveling west can see the river, and are therefore more likely to stop; this is borne out by the data, which indicates that 77% of those who stopped were traveling westward. The team noted that some stops were somewhat lengthy, as for lunch, and the mean stop length of nearly 12 minutes testifies to this. The study team speculated that this would be a good spot for some facilities for picnickers.

Table 10. Red Rock: Summary Viewpoint Data

Parking Data	
Median Duration of Stops (mins.)	10.0
Mean Duration of Stops (mins.) ^a	11.7
Percent of Observations Exceeding Observation Period	24%
Percent of Observations During Which the Lot Was Full ^c	4%
Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	7%
Visitor Data	
Mean Group Size (people)	2.8
People Using the Viewpoint During Peak Hours (per hour) ^{de}	61.0
Percent of Observed Visitors Driving Eastward	23%
Percent of Visitors Who Planned to Stop There	21%
Top Five Activities Observed During Stop^f	
Take Photograph	50%
View	47%
Take a Walk	13%
Quick Stop ^g	6%
Driving Break	5%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 10 a.m. and 4 p.m.

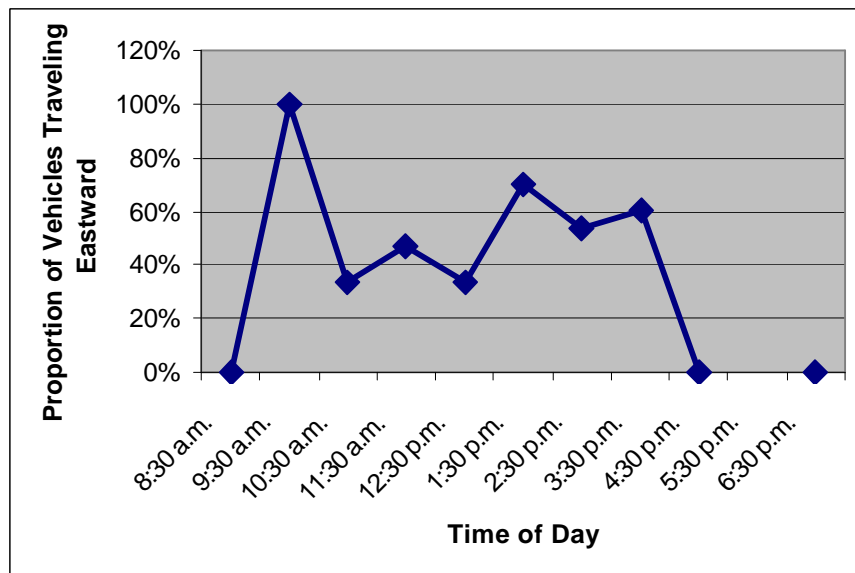
^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically did not exit their vehicle.

**Table 11. Duration of Stops
at Red Rock**

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	21%
5 to 15	46%
16 to 40	28%
> 40	4%



*77% of
travelers
stopping
at Red
Rock were
traveling
westward.*

Figure 14. Duration of Stops at Red Rock.

Upper and Lower Loop

The study team noted that parking at Upper and Lower Loop was often taken by hikers (6% of those who stopped at Upper Loop were observed to hike, and 9% at Lower Loop), and that available parking was often diminished if the first vehicles of the day started a pattern of parallel parking (rather than parking perpendicular to the edges). The team also noted that the availability of parking is often dictated by relationship to construction queues. Both lots were full relatively frequently. Approximately two-thirds of those stopping at the Loop were traveling Eastward. The National Park Service completed installation of bathrooms approximately two-thirds of the way through the study (in August); bathroom stops at Lower Loop quickly became a significant factor, as 16% of visitors to Lower Loop used the facilities. The study team also noted that:

- ? There is a particular section of 3 spots in the Upper Loop, right next to the shuttle, that turned over semi-constantly.
- ? Lots of drivers from the West don't see the Heaven's Peak sign until they are nearly past Lower Loop, then scramble to get into Upper Loop.
- ? People often mistake the '03 fire remains for the '67 fire remains.

Table 12. Upper Loop: Summary Viewpoint Data

Parking Data		
	Median Duration of Stops (mins.)	8.0
	Mean Duration of Stops (mins.) ^a	5.6
	Percent of Observations Exceeding Observation Period	36%
	Percent of Observations During Which the Lot Was Full ^c	36%
	Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	41%
Visitor Data		
	Mean Group Size (people)	2.7
	People Using the Viewpoint During Peak Hours (per hour) ^{de}	45.0
	Percent of Observed Visitors Driving Eastward	72%
	Percent of Visitors Who Planned to Stop There	41%
Top Five Activities Observed During Stop^f		
	Take Photograph	52%
	View	29%
	Hike	6%
	Quick Stop ^g	4%
	Driving Break	4%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.

^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically did not exit their vehicle.

Table 13. Duration of Stops at Upper Loop	
<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	39%
5 to 15	25%
16 to 40	5%
> 40	31%

Table 14. Duration of Stops at Lower Loop	
<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	31%
5 to 15	37%
16 to 40	6%
> 40	26%

Note: Direction of travel data was too sparse at Upper Loop to provide a useful graph of direction by time of day.

Table 15. Lower Loop: Summary Viewpoint Data		
Parking Data		
	Median Duration of Stops (mins.)	7.0
	Mean Duration of Stops (mins.) ^a	6.4
	Percent of Observations Exceeding Observation Period	32%
	Percent of Observations During Which the Lot Was Full ^c	14%
	Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	19%
Visitor Data		
	Mean Group Size (people)	2.7
	People Using the Viewpoint During Peak Hours (per hour) ^{de}	43.0
	Percent of Observed Visitors Driving Eastward	67%
	Percent of Visitors Who Planned to Stop There	39%
Top Five Activities Observed During Stop^f		
	View	34%
	Take Photograph	31%
	Bathroom	16%
	Hike	9%
	Driving Break	7%
^a Understates mean because some use exceeded the length of the observation period.		
^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.		
^c This measure is not equivalent to the amount of real time that the lot is full.		
^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.		
^e This calculation assumes that study periods are, on average, 2 hours.		
^f Multiple activities could be recorded for individual visitors.		

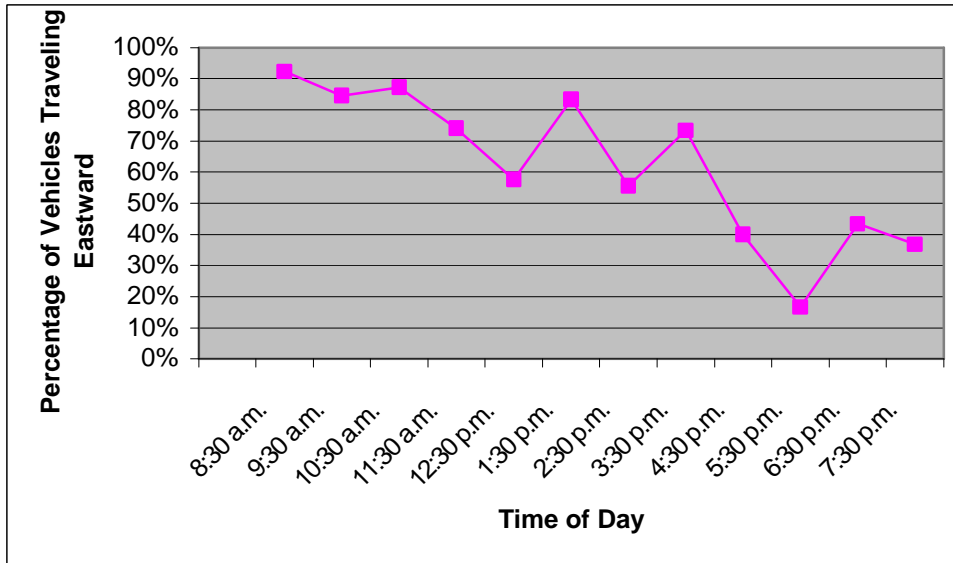


Figure 15. Proportion of Eastward Travel by Time of Day for Lower Loop

Big Bend

The study team noted that use of Big Bend was greater early in the summer because of viewable snow, waterfalls, and beargrass; visitation resurged a little at the end of summer with snowfall. Big Bend was heavily used (62 people per peak hour), but never full. Stops were short, with 90% being 15 minutes or less. The team described Big Bend as an easy to use, safe viewpoint. They noted that the Goal and Triple Arch exhibits/signs fool people into looking for them from the lot (people peer up at some white rocks).

Table 16. Big Bend: Summary Viewpoint Data

Parking Data

Median Duration of Stops (mins.)	5.0
Mean Duration of Stops (mins.) ^a	6.4
Percent of Observations Exceeding Observation Period	13%
Percent of Observations During Which the Lot Was Full ^c	0%
Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	0%

Visitor Data

Mean Group Size (people)	3.3
People Using the Viewpoint During Peak Hours (per hour) ^{de}	62.0
Percent of Observed Visitors Driving Eastward	79%
Percent of Visitors Who Planned to Stop There	19%

Top Five Activities Observed During Stop^f

Take Photograph	64%
View	42%
Exhibit	9%
Quick Stop ^g	6%
Driving Break	4%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.

^e This calculation assumes that study periods are, on average, 2 hours.

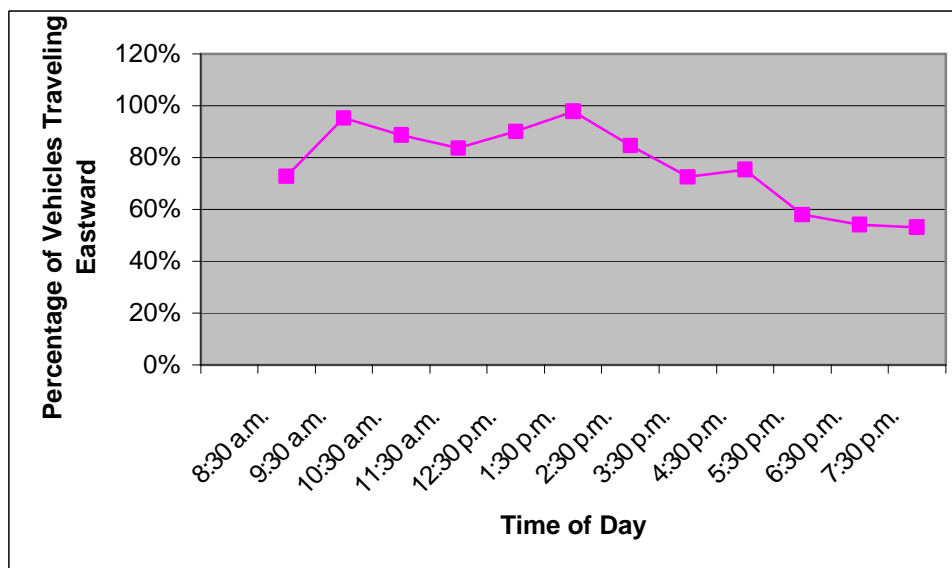
^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically did not exit their vehicle.

Table 17. Duration of Stops at Big Bend

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	45%
5 to 15	45%
16 to 40	8%
> 40	2%

90% of stops at Big Bend were 15 minutes or less.



79% of vehicles stopping at Big Bend were traveling Eastward.

Figure 16. Proportion of Eastward Travel by Time of Day for Big Bend

Oberlin Bend

The study team described Oberlin Bend as “chaotic.” The team noted that the seemingly-constant presence of mountain goats causes spur-of-the-moment parking efforts, and that vehicles attempting to park are often obstructed. Indeed, during peak hours the team noted that the parking lot was full more than half the times vehicles attempted to park. The team noted foot traffic between Oberlin and Logan Pass—if Logan Pass is full, people will park at Oberlin and walk up. Compared to other studied viewpoints that do not double as hiking trailheads, turnover at Oberlin Bend was quite slow (with a mean of 12 minutes), likely owing to both the wildlife and those who walked to Logan Pass. The study team also noted that:

- ? People treat the goats as if they’re tame; a goat once charged a large leashed dog, and false-charged a young child.
- ? People lay out trails of food for the ground squirrels.
- ? Visitors pick flowers, feed animals, and trample restoration areas.

Table 18. Oberlin Bend: Summary Viewpoint Data

Parking Data	
Median Duration of Stops (mins.)	12.0
Mean Duration of Stops (mins.) ^a	12.2
Percent of Observations Exceeding Observation Period	28%
Percent of Observations During Which the Lot Was Full ^c	32%
Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	54%
Visitor Data	
Mean Group Size (people)	3.0
People Using the Viewpoint During Peak Hours (per hour) ^{de}	45.0
Percent of Observed Visitors Driving Eastward	52%
Percent of Visitors Who Planned to Stop There	30%
Top Five Activities Observed During Stop^f	
Take Photograph	65%
Walk	34%
View	32%
Driving Break	3%
Hike	3%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.

^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

**Table 19. Duration of Stops
at Oberlin Bend**

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	13%
5 to 15	53%
16 to 40	27%
> 40	8%

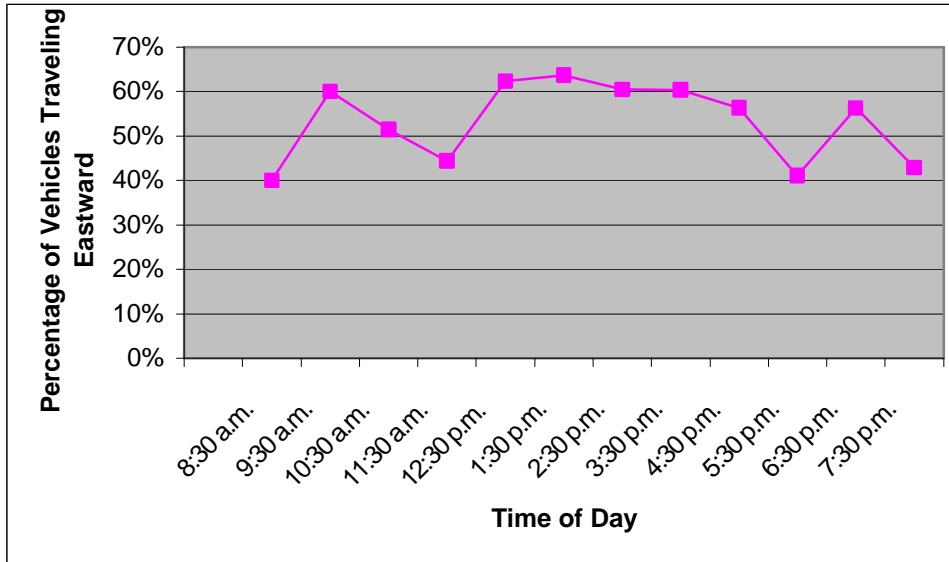


Figure 17. Proportion of Eastward Travel by Time of Day for Oberlin bend

Lunch Creek

Lunch Creek was often quite lightly used, and was virtually never full. However, during peak hours it did accommodate 39 people per hour. The team noted a clear relationship between the saturation of Logan Pass and the use of Lunch Creek; people wouldn't park and walk up to the Pass, but they would picnic or make other utility stops, or simply rest for a few minutes before going back up to try Logan again. Some hiking occurred at Lunch Creek—the study team observed that, with Logan Pass full, would start appearing and taking short (approximately one hour) hikes. The study team speculated that people would hike at Lunch Creek as a substitute for Hidden Lake.

Table 20. Lunch Creek: Summary Viewpoint Data

Parking Data	
Median Duration of Stops (mins.)	8.0
Mean Duration of Stops (mins.) ^a	9.9
Percent of Observations Exceeding Observation Period	27%
Percent of Observations During Which the Lot Was Full ^c	1%
Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	2%
Visitor Data	
Mean Group Size (people)	2.6
People Using the Viewpoint During Peak Hours (per hour) ^{de}	39.0
Percent of Observed Visitors Driving Eastward	61%
Percent of Visitors Who Planned to Stop There	26%
Top Five Activities Observed During Stop^f	
Take Photograph	60%
View	25%
Walk	11%
Picnic	6%
Quick Stop ^g	6%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.

^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically did not exit their vehicle.

Table 21. Duration of Stops at Lunch Creek

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	31%
5 to 15	38%
16 to 40	20%
> 40	10%

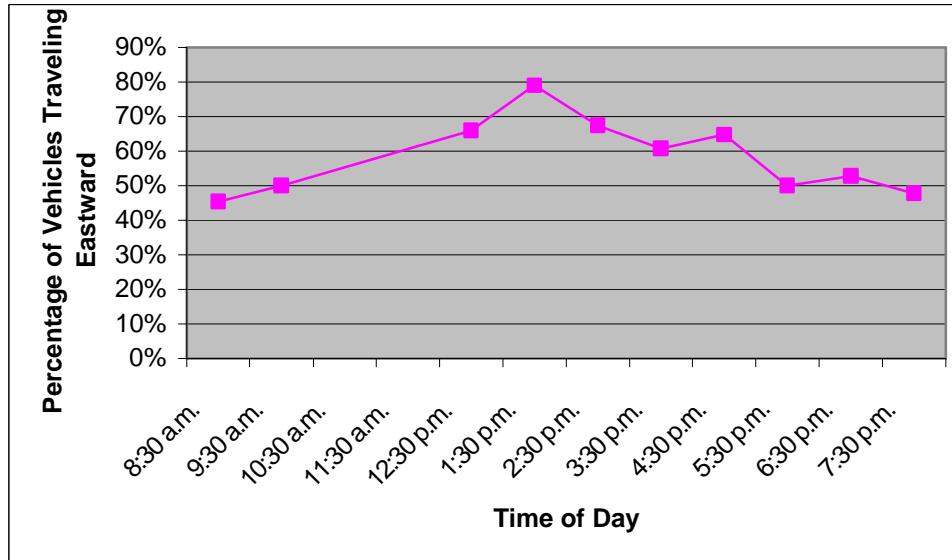


Figure 18. Proportion of Eastward Travel by Time of Day for Lunch Creek

Siyeh Bend

Twenty-three percent of those who stopped at Siyeh Bend were observed to hike, and, indeed, the median stop duration of 17 minutes indicates long stops. The study team noted that some days they would observe the lot for two hours without seeing anybody leave (more than half of the team's total observations exceeded the study period; only 15 people per peak hour used the viewpoint). The study team noted that whether initial parking was parallel or perpendicular dramatically affected available space. The study team also noted that the exhibit is frequently read, but is not of central interest.

Table 22. Siyeh Bend: Summary Viewpoint Data

Parking Data	
Median Duration of Stops (mins.)	17.0
Mean Duration of Stops (mins.) ^a	5.8
Percent of Observations Exceeding Observation Period	53%
Percent of Observations During Which the Lot Was Full ^c	27%
Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	39%
Visitor Data	
Mean Group Size (people)	2.7
People Using the Viewpoint During Peak Hours (per hour) ^{de}	31.0
Percent of Observed Visitors Driving Eastward	46%
Percent of Visitors Who Planned to Stop There	50%
Top Five Activities Observed During Stop^f	
Take Photograph	26%
Hike	23%
View	21%
Exhibit	10%
Quick Stop ^g	4%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.

^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically did not exit their vehicle.

**Table 23. Duration of Stops
at Siyeh Bend**

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	29%
5 to 15	21%
16 to 40	10%
> 40	41%

*41% of visitors
at Siyeh Bend
stayed longer
than 40 minutes.*

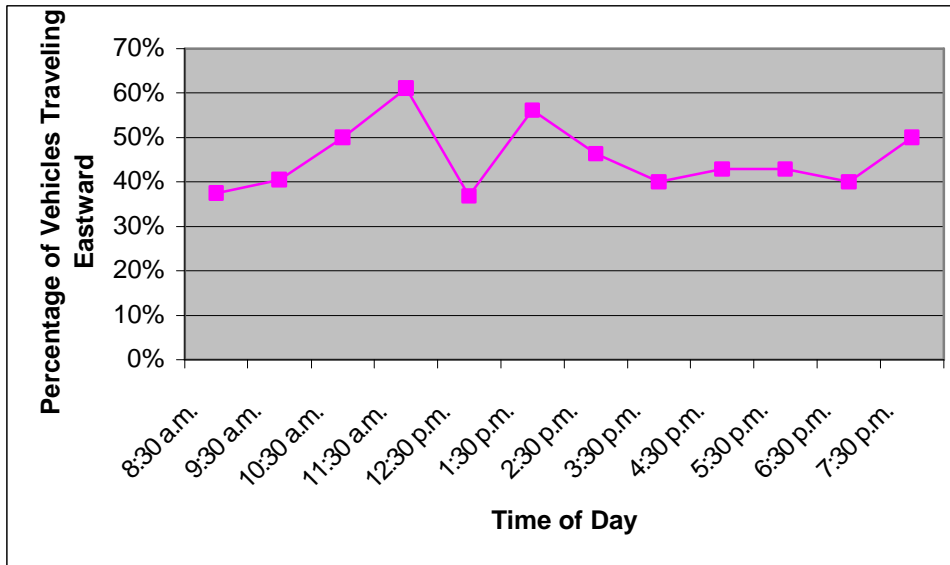


Figure 19. Proportion of Eastward Travel by Time of Day for Road Camp

Upper and Lower Jackson

Upper Jackson, accommodating 95 people per hour during peak hours, was the busiest of the viewpoints studied. Turnover was extremely quick, with a median stop duration of just four minutes, and with more than 98% of all stops lasting 15 minutes or less. The team described Upper Jackson as chaotic, and noted that Jammers stop there, sometimes double parking. Lower Jackson, accommodating just 15 people per peak hour, is significantly less busy; its median stop length of 16 minutes and large numbers of observations exceeding the study period (54%) are partly an artifact of the large number of hikers who park at Lower Jackson. The study team noted that the glacier is not visible from the sign extolling it, and suggested moving the sign 25 feet.

Table 24. Upper Jackson: Summary Viewpoint Data

Parking Data	
Median Duration of Stops (mins.)	4.0
Mean Duration of Stops (mins.) ^a	4.5
Percent of Observations Exceeding Observation Period	7%
Percent of Observations During Which the Lot Was Full ^c	2%
Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	3%
Visitor Data	
Mean Group Size (people)	3.4
People Using the Viewpoint During Peak Hours (per hour) ^{de}	95.0
Percent of Observed Visitors Driving Eastward	68%
Percent of Visitors Who Planned to Stop There	35%
Top Five Activities Observed During Stop^f	
Take Photograph	73%
View	41%
Exhibit	24%
Quick Stop ^g	4%
Driving Break	3%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.

^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically did not exit their vehicle.

Table 25. Duration of Stops at Upper Jackson

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	57%
5 to 15	42%
16 to 40	1%
> 40	1%

More than 98% of stops at Upper Jackson lasted 15 minutes or less.

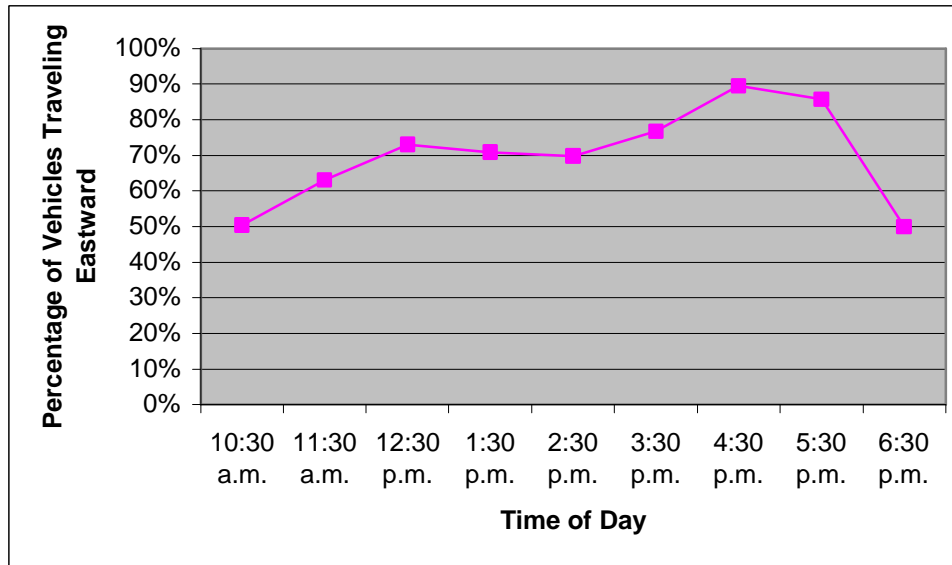


Figure 20. Proportion of Eastward Travel by Time of Day for Upper Jackson

St. Mary Falls

St. Mary Falls functions to a great extent as a trailhead: 68% of visitors were there were observed to hike, and the median stop duration of all vehicles there was 43 minutes (twice as long as the next longest median duration among viewpoints studied). The study team estimated that a typical hiking stop was 1 to 1.5 hours. The parking lot was frequently full: 44% of the time people tried to park there during peak hours it was full. The team noted that backing out safely at the viewpoint is difficult, and said that the great speed of traffic makes pulling out challenging. The study team also noted that:

- ? People look for the falls from the viewpoint. (Many folks fail to interpret the hiker symbol as indicating it is not an overlook.)
- ? The sign is not immediately visible, and is in kilometers.

Table 26. St. Mary Falls: Summary Viewpoint Data

Parking Data	
Median Duration of Stops (mins.)	43.0
Mean Duration of Stops (mins.) ^a	21.8
Percent of Observations Exceeding Observation Period	54%
Percent of Observations During Which the Lot Was Full ^c	34%
Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	44%
Visitor Data	
Mean Group Size (people)	2.8
People Using the Viewpoint During Peak Hours (per hour) ^{de}	15.0
Percent of Observed Visitors Driving Eastward	53%
Percent of Visitors Who Planned to Stop There	35%
Top Five Activities Observed During Stop^f	
Hike	68%
Quick Stop ^g	6%
Photo	5%
Driving Break	4%
View	4%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.

^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically did not exit their vehicle.

**Table 27. Duration of Stops
at St. Mary Falls**

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	16%
5 to 15	11%
16 to 40	20%
> 40	52%

*More than half of
visitors parked for
more than 40
minutes at St.
Mary Falls.*

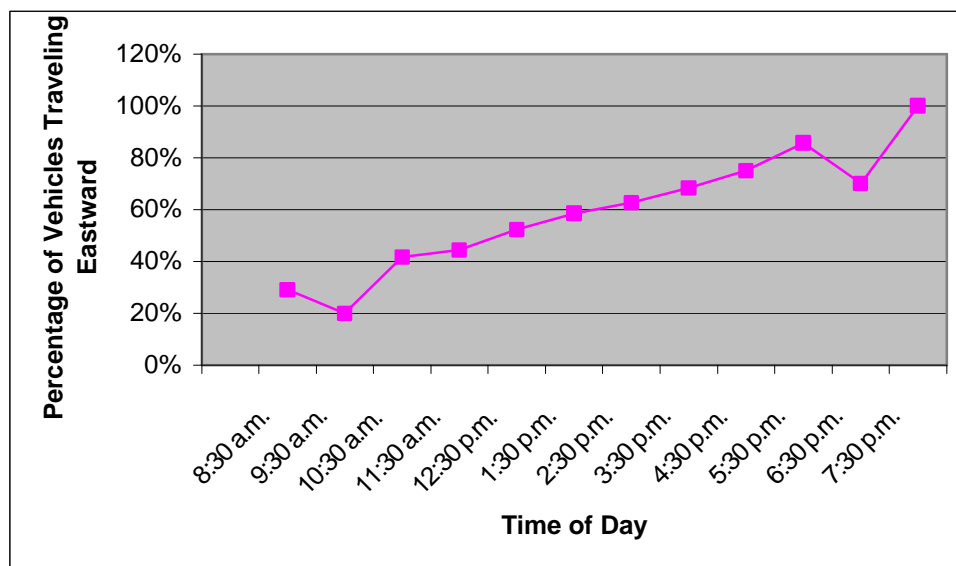


Figure 21. Proportion of Eastward Travel by Time of Day for St. Mary Falls

Sunrift Gorge

The study team described Sunrift Gorge as accommodating some hiking—13% of observed visitors hiked and 27% walked—but as having generally high turnover. The team described Sunrift Gorge as one of the best planned turnouts, lauding the signs, parking, and cross-walk.

Table 28. Sunrift Gorge: Summary Viewpoint Data

Parking Data

Median Duration of Stops (mins.)	13.0
Mean Duration of Stops (mins.) ^a	13.5
Percent of Observations Exceeding Observation Period	37%
Percent of Observations During Which the Lot Was Full ^c	9%
Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	11%

Visitor Data

Mean Group Size (people)	3.0
People Using the Viewpoint During Peak Hours (per hour) ^{de}	43.0
Percent of Observed Visitors Driving Eastward	42%
Percent of Visitors Who Planned to Stop There	43%

Top Five Activities Observed During Stop^f

Take Photograph	55%
Walk	27%
View	23%
Hike	13%
Quick Stop ^g	4%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.

^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically did not exit their vehicle.

**Table 29. Duration of Stops
at Sunrift Gorge**

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	14%
5 to 15	44%
16 to 40	25%
> 40	16%

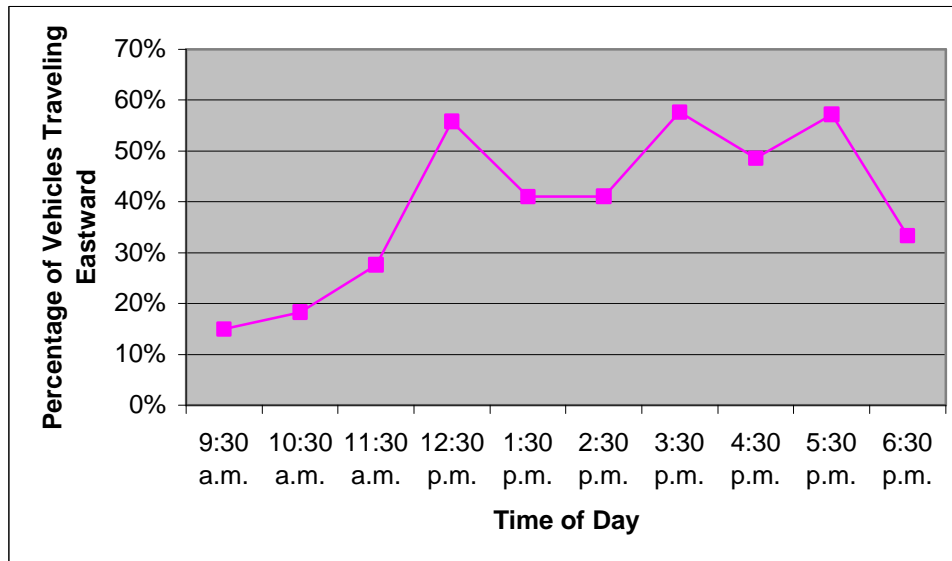


Figure 22. Proportion of Eastward Travel by Time of Day for Sunrift Gorge

Wild Goose Island

Wild Goose Island has quick turnover, with a median stop duration of just 5 minutes and 95% of stops lasting 15 minutes or less. The study team noted that many visitors simply get a quick picture and go, and that many times only one person gets out of a car. The team was concerned about safety at Wild Goose Island, noting that the viewpoint is right on the road, that traffic is going 45 to 50 miles per hour, and that kids and others climb out without awareness of traffic. The study team lauded the Jammer crews for safely stopping traffic, but suggested rumble strips or some other traffic warning system.

Table 30. Wild Goose Island: Summary Viewpoint Data

Parking Data	
Median Duration of Stops (mins.)	5.0
Mean Duration of Stops (mins.) ^a	5.8
Percent of Observations Exceeding Observation Period	10%
Percent of Observations During Which the Lot Was Full ^c	0%
Percent of Observations During Which the Lot Was Full: Peak Hours ^{cd}	0%
Visitor Data	
Mean Group Size (people)	3.4
People Using the Viewpoint During Peak Hours (per hour) ^{de}	58.0
Percent of Observed Visitors Driving Eastward	42%
Percent of Visitors Who Planned to Stop There	33%
Top Five Activities Observed During Stop^f	
Take Photograph	85%
View	51%
Exhibit	10%
Quick Stop ^g	4%
Driving Break	2%

^a Understates mean because some use exceeded the length of the observation period.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c This measure is not equivalent to the amount of real time that the lot is full.

^d Peak hours included any observation period for which more than 75% of the study period was between 11 a.m. and 5 p.m.

^e This calculation assumes that study periods are, on average, 2 hours.

^f Multiple activities could be recorded for individual visitors.

^g "Quick Stop" describes short duration stops where visitors typically did not exit their vehicle.

**Table 31. Duration of Stops
at Wild Goose Island**

<i>Duration in Minutes</i>	<i>Percent of Vehicles</i>
< 5	43%
5 to 15	52%
16 to 40	4%
> 40	1%

*95% of stops were 15
minutes or less.*

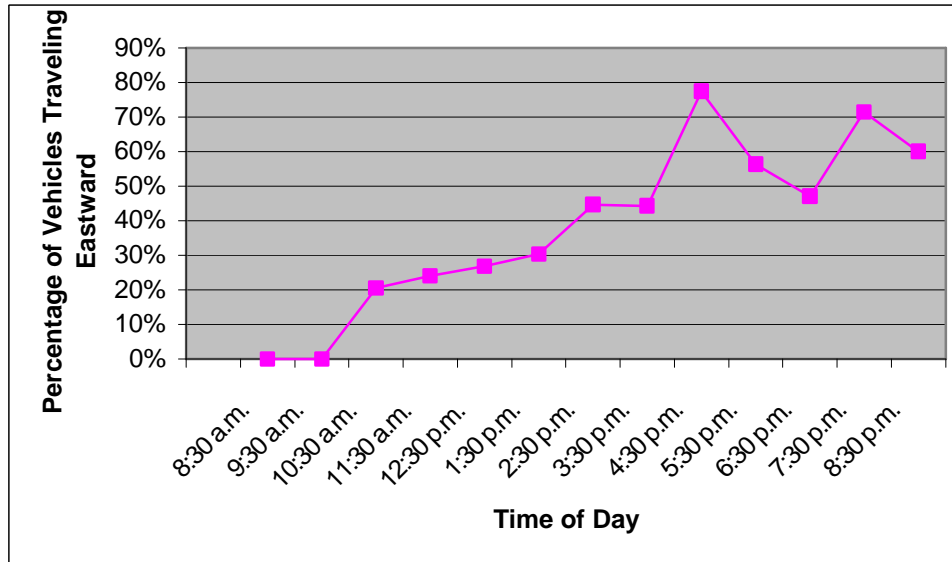


Figure 23. Proportion of Eastward Travel by Time of Day for Wild Goose Island

Appendix: Methods

Observations and interviews were stratified over 60 days between June 26 and August 13, 2005 (encompassing the heart of the season on GTSR). There were 13 viewpoints along the GTSR selected (through a joint UM-NPS analysis) for study in this project (for sampling purposes, the Loop viewpoint is considered two viewpoints—an upper and lower parking lot). Viewpoints were sampled during the primary daylight hours of operation—basically from 8 a.m. until 8 p.m. in two-hour sampling periods. Sampling was conducted using 2 person crews so that both observational and interview data could be collected. Two crews will be hired for the project. Each crew was limited to three two-hour sampling periods per day (because of travel times and data entry needs).

There were 6 two-hour sampling periods per day. Generally, each period-viewpoint combination was sampled between 3 and 4 times during the study. The viewpoints were grouped into blocks of three in order to reduce travel costs. A total of four blocks of three viewpoints were thus created (although the Loop viewpoint was considered two viewpoints, each crew sampled only one parking lot, thus for developing the sampling plan it involved only one sampling viewpoint). Sampling occurred in three consecutive sampling periods, and not randomly from the 6 two-hour periods in a day.

The sampling procedure used a systematic random sampling process in which the initial viewpoint and period was randomly selected for each of the two crews. Following the initial selection, the other two viewpoints (for each crew) was sampled randomly from the other two periods available in that day. Following the initial day of sampling, sampling periods and viewpoints were rotated systematically to ensure that over the study period each viewpoint was sampled 3-4 times during each two-hour period of the day. By design, Friday, Saturday, and Sunday were sampled more intensively.

Interview data was entered into personal data assistants by respondents during the interview. Once crews arrived at the designated viewpoint, the first 10 visitor groups to arrive at that point were asked to complete the short interview. One person from each group completed the interview. The sampled person was an adult (18 years of age and older), and was systematically rotated among potential passengers within the group. Since weather conditions and thus use levels vary, as expected, we were unable to complete 10 interviews during each sampling period.

There were 7,110 total valid observations; 71% of those observations included both a start and end time. 1,756 individuals were asked to participate in the survey; 1,707 (97.7%) agreed.

Analysis in this report excludes from consideration respondents who refused to or failed to answer a question. Thus, for example, 70% *of those who respondents who answered the question* stated that they were likely to take a free shuttle departing every half hour.

Table 32. Viewpoint Breakdown of Study Sites, Periods, and Interview Participation

Viewpoint	Number of Study Periods	Number of Peak Time Study Periods^a	Total Observations	Percent of Total Observations	Observations Fully Captured in the Study Period	Observations Not Encompassed by the Study Period^b	Number of Survey Participants^c	Percent of Survey Participants
Road Camp	20	9	174	2%	140	20%	11	1%
Red Rock	17	8	639	9%	484	24%	163	10%
Upper Loop	5	4	220	3%	141	36%	69	4%
Lower Loop	14	4	411	6%	280	32%	101	6%
Big Bend	26	11	806	11%	703	13%	195	11%
Oberlin Bend	25	8	1184	17%	852	28%	228	13%
Lunch Creek	17	8	374	5%	274	27%	108	6%
Siyeh Bend	18	8	428	6%	203	53%	123	7%
Upper Jackson	16	9	814	11%	756	7%	220	13%
Lower Jackson	19	11	379	5%	176	54%	76	4%
St. Mary Falls	19	10	477	7%	145	70%	143	8%
Sunrift Gorge	19	10	546	8%	343	37%	134	8%
Wild Goose Island	21	13	658	9%	589	10%	135	8%
Total	236	113	7110		5086	28%	1707	

^a Peak time is defined as 10:00 a.m. to 4:00 p.m. for Road Camp and Red Rock; as 11:00 a.m. to 5:00 p.m. for all other viewpoints. Study periods were considered "peak time" if three-quarters or more of the study period was encompassed by peak hours.

^b Identifies the percent of observed vehicles that had arrived prior to the study period, departed subsequent to the study period, or both.

^c One survey did not identify location.

Appendix

48