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Assessing Going-to-the-Sun Road Travelers' Attitudes, Knowledge, and Perceptions of Bicycling

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Assessing Going-to-the-Sun Road Travelers' Attitudes, Knowledge, and Perceptions of Bicycling

A Quasi-Experimental Design

Brian Battaglia, Research Assistant and Norma P. Nickerson, Ph.D.

5/11/2016



This report provides a comparison of three cyclist groups and a non-cyclist group's attitudes towards bicycling, knowledge of roadway cycling laws, perceived fear of bicycling, and perceived bicycle-automobile interactions between visitors of Glacier National Park. In addition, an experimental sign and brochure were introduced for assessing knowledge of bicycling laws.

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Assessing Going-to-the-Sun Road Travelers' Attitudes, Knowledge, and Perceptions of Bicycling

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Abstract

Visitors of the Going-to-the-Sun Road (GTSR) are primarily scenic drivers, yet niche groups of bicyclists have a stake in sharing the GTSR. Conducting a quantitative survey assessment on the bicycling attitudes of visitors produced key findings for determining visitor support for bicycling along the GTSR. Park officials are in a position to evaluate data on bicycling attitudes for visitor management and transportation decision making along the Going-to-the-Sun Road.

Executive Summary

This report provides an analysis and comparison of bicyclist and non-bicyclist visitors to Glacier National Park (GNP) in 2015. An 84 percent response rate was obtained from intercepting visitors at Logan Pass. Non-bicyclists made up 18 percent of the sample, and people who have bicycled in the past 12 months made up 82 percent of the sample. The sample's GTSR transport mode primarily consisted of auto passengers (44%), followed by drivers (39%), and then bicyclists (11%). Visitors prefer traveling the GTSR slowly.

- GNP visitors were neutral to positive in their attitudes towards bicycling.
- GNP visitors were more critical of motorist behavior than cyclist behavior.
- Data suggests there is bilateral support for increasing education on sharing the road and encouraging more courteous behaviors between cyclists and motorists.
- The non-bicyclist group reported less knowledge of roadway bicycling laws than the three bicyclist groups, while visitors who were knowledgeable of bicycling laws were more positive in their bicycling attitudes.
- The more visitors participate in bicycling, the less they perceive it with fear, and as perceptions of fear decreased, bicycling attitudes improved.
- Bicyclists perceived their interaction with motorists on the GTSR as positive.
- Motorists perceived their interaction with bicyclists on the GTSR as neutral to positive.
- Visitor support for GTSR bicycling increased as bicycling attitudes improved.
- When presented with the statement "Bicyclists should be allowed to travel along the GTSR any time of day," respondents were generally neutral to slightly positive.
- In the experimental study, it was found that if you get bicycle educational information in the visitors' hands, they will read it. A brochure was effective at improving knowledge that a bicycle is a legal vehicle with the same rights and responsibilities as a motor vehicle. 57% of the treatment group was knowledgeable that a bicycle is considered a legal vehicle with the same rights/responsibilities compared with 47% of the control group.
- In the experimental study, signage was effective at improving knowledge that a bicycle may utilize a traffic lane. 35% of the treatment group was knowledgeable that a bicycle may use a full lane compared with 16% of the control group.
- Comparing the roadway characteristics of Apgar – Sprague Creek (restricted) vs. Sprague Creek – Logan Creek (unrestricted) revealed that the western restriction should be reconsidered based on elevation gain/loss, sinuosity, and attitudes toward bicycling.

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Introduction

In 2013, the Institute for Tourism and Recreation Research (ITRR) at the University of Montana conducted an analysis on touring bicyclists that attracted considerable attention from Adventure Cycling Association (ACA) and Glacier National Park (GNP). Nickerson, et al.'s (2013) study raised concerns regarding bicyclist-automobile interactions, safety, and the beliefs and attitudes people have towards bicycling along Montana's roadways. Many of those respondents had bicycled in Glacier National Park. Glacier officials agreed that data on bicycling in Glacier was virtually nonexistent, and permitted ITRR to conduct a project to further the understanding of GNP visitors' bicyclist-automobile perceptions, attitudes, knowledge of roadway bicycling laws, and overall support for bicycling along the Going-to-the-Sun Road (GTSR) in Glacier National Park.

Glacier National Park (GNP) is one of the most visited places in Montana, and a record number of people (roughly 2.3 million) visited GNP in 2015. To a large extent, automobile impacts are concentrated along the Going-to-the-Sun Road (GTSR) travel route, and bicycling as an alternative transportation mode is lacking empirical observations. At the same time, bicycling is re-gaining popularity around the United States as evident through research done by Pucher and Buehler (2011), where the authors document a significant rise in North American bicycling for commuting across U.S. cities. The National Highway Traffic Safety Administration (Royal and Miller-Steiger, 2008) reported that 47 percent of Americans would like to see more bicycle facilities in their communities. The increased desire Americans have to utilize the bicycle during tourism, recreation, and leisure time creates new management challenges for the National Park Service.

The National Park Service (NPS) has recognized the rapid growth in visitation over the past several decades and have highlighted the importance of addressing transportation impacts associated with the personal automobile (NPS Transportation Planning Guidebook, 1999). The NPS's Alternative Transportation Program has outlined that "the automobile cannot always be the primary mode of transportation" (Daigle, 2008). Nevertheless, people are increasingly being attracted to national parks to engage in pleasure driving as a park experience (Hallo and Manning, 2009), but a study by Giordano (2002) found that traffic on the GTSR in Glacier detracted from the positive visitor experience. This, teamed with the increased interest in bicycling in national parks, provides a challenge to managers. In Glacier, the challenge is even more difficult as there are no data available providing park managers with the lived experiential interactions and preferences of cyclists and motorists in GNP to date.

With the gap in data regarding bicyclists and motorists in GNP, this study highlights the general attitudes people carry with them about bicycling, how often these visitors bicycle in their daily life, their knowledge about bicycle laws, and, finally, their interaction with the other mode of travel (bicyclist or motorists). In addition, since GNP appears to be experiencing increases in bicyclists in the park, understanding communication techniques geared to the

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visitors about bicyclists and motorists on the GTSR is an important component for visitor safety in the park.

Tourism and outdoor recreation social scientists, as well as national park officials and the Federal Highway Administration will benefit from the empirical evidence gathered through this study, not to mention visitors to Glacier National Park.

Purpose

The first purpose of this study was to assess attitudes, knowledge, and perceptions of bicycling by people who visit Glacier National Park. A second purpose was to test the effectiveness of bicycle signage along the road as well as an informative brochure on bicycling laws and regulations handed to visitors at the park entrances. A third purpose was to assess the partial bicycling restriction in place on the GTSR.

The ultimate goal of this study was to provide GNP managers with as much information as possible about bicycling in Glacier so as to assist in any future bicycling-related decisions, including the use of informational techniques and an assessment on the current bicycle restrictions on the GTSR.

Research Questions

The following research questions were answered in this study:

1. Do visitors differ in their bicycling attitudes, knowledge of roadway bicycling laws, perceived fear, and level of support for GTSR bicycling based on their level of bicycling frequency?
2. Do visitors differ in their bicycling attitudes based on their knowledge of roadway bicycling laws?
3. What is the relationship between support for bicycling on the GTSR and bicycling attitudes?
4. What is the relationship between bicycling attitudes and perceptions of fear?
5. Can knowledge of roadway bicycling laws be improved with signage and an educational brochure as experimental treatments?
6. Are perceptions of interactions on the GTSR positive or negative between cyclists and motorists?
7. Is there justification for the GTSR bicycling restrictions based on attitudes and behaviors and an assessment of the roadway's elevation and sinuosity?

Literature Review

In this literature review, bicycling studies were examined for supporting an empirical quantitative survey assessment to test attitudes, perceptions, and knowledge between cyclists and non-cyclists in Glacier National Park.

Bicycling Attitudes

An attitude related to bicycling on roadways can be defined as “general orientation towards cyclists and the degree to which they are viewed as legitimate road users, as well as the subjective assessment of the characteristics of cyclists as sharers of road space” (Bashford et al., 2003). Bashford et al. (2003) found that the attitude toward bicycling of motorists' who were also bicyclists did not differ greatly from non-bicyclists in a given context. Sander's (2013) dissertation suggests that bicyclists have softer attitudes towards bicycling compared with non-bicyclists. Examining attitudes in relation to bicycling frequency in a recreation and leisure context in Glacier National Park may help to close the gap between the findings of Bashford and others. In the proceeding sections and chapters, an attitude towards bicycling will simply be referred to as a “bicycling attitude.”

Bicycling Frequency

Research shows that people who drive, yet have some level of experience and frequency in bicycling, are more sensitive in their bicycling attitudes. Additionally, it has been found that those who participate in bicycling more often also have an improved general support for bicycling (Sanders, 2013). The academic fields focusing on urban bicycle transportation frequently categorizes bicyclists as to avoid a homogenous understanding of bicycling behaviors and attitudes (Dill and Voros, 2007). It is evident in bicycle literature, whether for recreation, tourism, or transportation studies, that a frequency of bicycling participation should be established before assessing associations with knowledge of roadway bicycling laws, bicycling attitudes, and behavioral perceptions that occur on the Going-to-the-Sun Road.

Knowledge of Roadway Bicycling Laws

Studies (Rissel et al., 2002; Sanders, 2013) show that drivers who have lower knowledge pertaining to the roadway bicycling laws also showed poor bicycling attitudes. In a study by Bashford et al. (2003), no significant difference was found in bicycling attitudes based on bicycling experience. Other research (O'Connor and Brown, 2010) has shown that knowledge and experience affect bicycle-auto interactions and attitudes amongst enthusiastic bicyclists. The O'Connor and Brown (2010) study falls short in only examining enthusiastic bicyclists and a further quantitative examination of knowledge between bicyclists with varying degrees of experience and non-bicyclists may help to close the gap between the findings of Bashford and others.

Drivers frequently express that bicyclists do not ride properly on the road, or, according to Rissel et al's (2002) study, that drivers perceived bicyclists as being “not courteous” on the

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road. There is a lot of ambiguity amongst drivers on what proper bicycling behavior is, and drivers may view a bicyclist who utilizes their full lane as being “not courteous.” The Montana state bicycling laws ultimately deems it up to the bicyclist to determine where they feel safest in the travel lane.

Informational Messaging and Bicycling Signage

A majority (49) of the 50 states' transportation policies across the U.S. recognize a bicycle as “having all the same rights and duties as a driver,” and many states recognize a bicycle as a legal vehicle (The League of American Bicyclists, 2015). Furthermore, Hess and Peterson (2015) suggest that the 50 states generally permit a bicycle to be in the full travel lane. Hess and Peterson's (2015) study tested the relationship between three informational messages on traffic signs (no sign, share the road, and bicycle may use full lane) and the degree to which respondents recognized bicyclists' rights to use the road; they found the “bicycle may use full lane” sign to be most effective (especially amongst people who bicycled the least frequently) in legitimizing roadway bicycling, and no significant differences were found between no sign vs. a share the road sign. Share the road signs contribute to the ambiguity surrounding proper bicycling behavior because of the potential to be misused by drivers to claim that bicyclists should move over to the right and stay out of the traffic lane (Bike Delaware, 2014; Hess and Peterson, 2015). The “Bicycles May Use Full Lane” sign is a clearer message that helps to alleviate misunderstandings when a road is too narrow for a bicycle and a motor vehicle to share while overtaking is occurring (especially when there is oncoming traffic). The GTSR fits the description of a narrow road with insufficient space for bicycles and motorists to share a lane and park managers could benefit from an experimental study to test bicycling attitude differences between visitors who read a “Bicycle May Use Full Lane” sign (treatment group) and those who do not (control group).

Motorist Behavior and Cyclist Behavior

Techniques for improving human behaviors within a park and recreation context using educational information as well as dialog between groups about correct behaviors which need to be addressed have been highlighted by Kaiser & Fuhrer (2003). Managers can attempt to mitigate unsafe behaviors and conflicts by providing educational information to those who enter the recreational setting (Hendee & Dawson, 2002). There is a potential for implementing an experimental design to disseminate informational messaging pertaining to the Montana laws, rules, and responsibilities of roadway bicycling to reduce conflicts, improve attitudes, and increase safety along the Going-to-the-Sun Road. Furthermore, no data exists on whether park visitors are critical of motorist/bicyclist roadway behaviors, and the degree to which they value bilateral courteous behaviors and support for education pertaining to sharing the road between bicyclists and motorists.

Perceived Fear of Bicycling

Determinants that influence bicycle commuting shares have been researched by Pucher and Beuhler (2006), where they indicate fear and safety as important factors preventing

ridership. In a study conducted by O'Connor and Brown (2010) that included only enthusiastic cyclists, no significant differences were found between bicyclists with varying levels of experience when asked "is bicycling on the road safe." Other reports (Horton, 2006; Sanders, 2013) that investigated the emotional side of bicycling within society found that people who ride their bikes more often are less fearful and more positive in their bicycling attitudes. Sander's (2013) study suggests that perceived fear of bicycling is related to general support for bicycling, but no studies have attempted to measure the relationship between bicycling frequency and perceptions of fear within a national park context, and how those perceptions of fear then correlate with bicycling attitudes and support for GTSR bicycling.

Bicycle-Automobile Perceived Interactions

A perception can be theoretically defined as "the response of the senses to external stimuli and purposeful activity in which certain phenomena are clearly registered while others recede in the shade or are blocked out" (Tuan, 1974). Researchers (O'Connor and Brown, 2010; Heesch et. al, 2011) found an abundance of bicyclists registering incidences of motorists passing too closely or acting aggressively. Others (Rissel et al, 2002; O'Connor and Brown, 2010) have reported that drivers find cyclists to be aggressive and frustrating to share the road with. Few studies have been conducted thus far to determine the levels of specialization (non-bicyclists to very frequent bicyclists) and its relationship to recreational conflicts pertaining to roadway bicycling. Furthermore, no evaluations have been made of the perceived interactions between motorized recreation (automobiles) and non-motorized recreation (bicyclists) along the GTSR. By studying perceived interactions and bicycling attitudes along the GTSR, an assessment of recreation conflict can be made between the groups (bicycle-auto), and a determination of acceptance/rejection of roadway bicycling will surface.

Summary

The documented history of support for bicycle touring (Ritchie, 1998) reiterates the need for a continuation of improvements that will aid in safety and adequacy of bicycle infrastructure, services, and facilities for the current era of bicycle tourists within GNP and throughout Montana. There is a gap in research on bicycling in GNP and the attitudes associated with the positive vs. negative outcomes of bicycling on the GTSR. Incorporating people's bicycling frequency and bicycling knowledge will help in understanding the associations to varying degrees of attitudes. Bicycling frequency levels are fundamental in making distinctions between those who bicycle regularly and those who never bicycle, and their relationship with bicycling attitudes. Finally, roadway knowledge pertaining to bicycle laws in Montana have not been explored as it relates to bicycling on the GTSR. Research has shown in other context areas that knowledge and experience affect bicycle-auto interactions and attitudes.

A final reiteration of the primary purpose of the study is as follows: to assess bicycling attitudes by three distinct categorizations of cyclists and non-cyclists on the GTSR in GNP and to measure differences in knowledge of roadway bicycling laws, perceived bicycle-automobile

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interactions, perceived fear associated with roadway bicycling, and support for bicycling on the GTSR. An experimental design was included to test for improvements in knowledge of roadway bicycling laws between a control group and a treatment group. The project attempts to understand the relationships between complex social processes of human behavior and mobility along the Going-to-the-Sun Road.



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Methodology

An onsite survey was conducted for this study at Logan Pass in Glacier National Park for two weeks in August 2015 (see Figure 1). Visitors were asked to complete a 1-page front and back legal size questionnaire in the parking lot of Logan Pass.

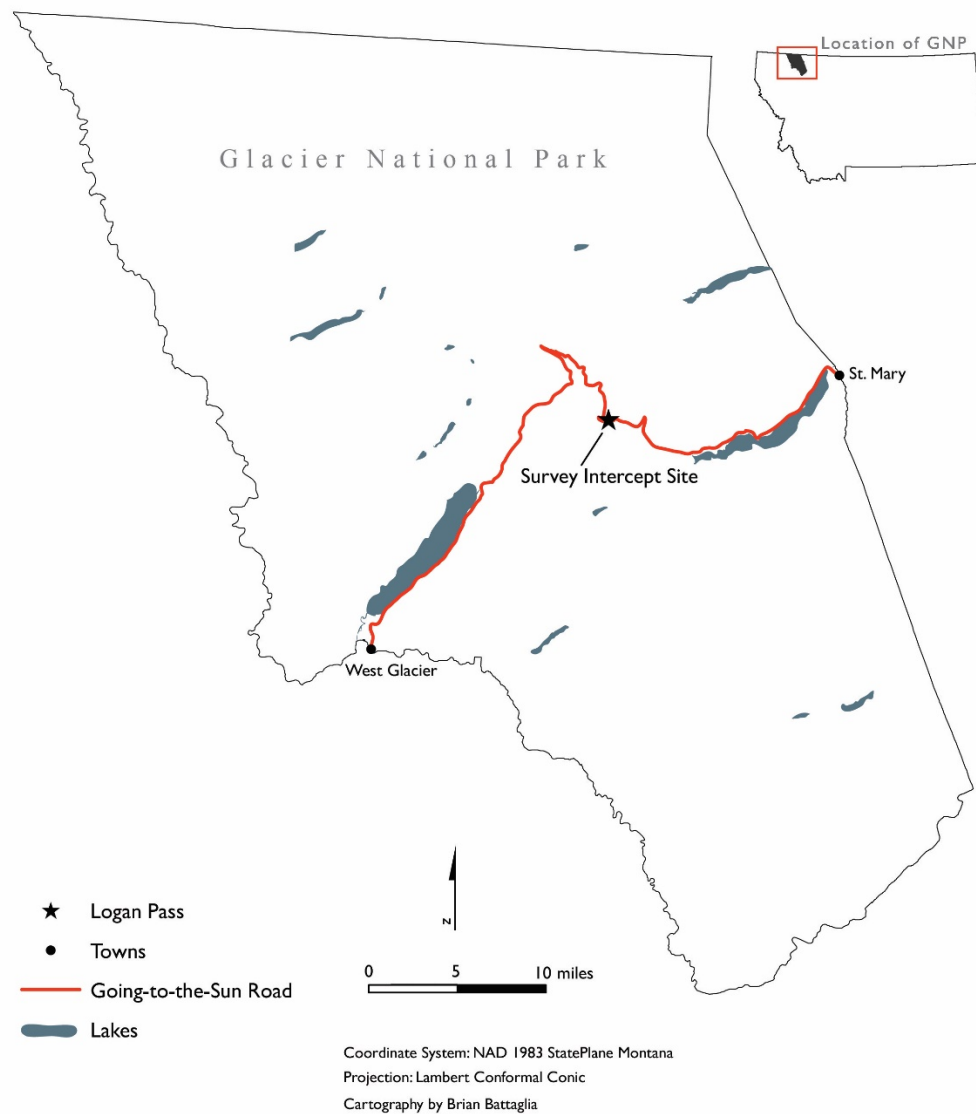


Figure 1. Map of Glacier National Park study area

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Survey Instrument - Defining Variables and Measurement

Through an exhaustive literature review, previously tested questions were used or adapted for the purposes of the questionnaire developed for this project (see Appendix A for survey; please note that the survey instrument from the appendix reflects the experimental design version – the experimental version is identical to the control version but Q12 and Q13 were added as manipulation/treatment checks). The survey had general questions about bicycling attitude, bicycling frequency, knowledge of bicycle laws, critiques of motorist and bicyclists driving behaviors. It also contained specific questions about interactions with bicyclists or motorists on the GTSR as well as level of support about bicycling on the GTSR. Finally, a few demographic questions were asked.

Study Design

This study was conducted with two main analysis criteria. First, we were interested in the differences between non-bicyclists and bicyclists to help explain attitudes and behaviors. Second, we were interested in determining, through an experimental design, whether or not two different forms of educational materials could increase GNP visitors' knowledge level of bicycling.

Treatments

Four signs from the Manual on Uniform Traffic Control Devices (MUTCD) reading "Bicycles May Use Full Lane" were placed on the GTSR (two signs on the west side and two on the east side) as a treatment condition to affect the experimental treatment group's knowledge of roadway bicycling laws. A second treatment for affecting knowledge included disseminating an educational brochure at the entrance gates (east and west) of GNP. The educational brochures had five statements directed at motorists and four statements directed at bicyclists. Two of the statements, "A bicycle is a legal vehicle with the same rights and responsibilities as a motor vehicle" and "Bicyclists May Use a Full Lane" were used as the main testing variables. Additional brochure wording reflected Montana roadway laws, rules, and the framework of share the road as outlined by the Montana Department of Transportation, as to avoid any liabilities from the project's influence on changes in people's transportation behaviors. A total of 40,000 brochures were printed and assembled into the park information packet, and distributed by the entrance gate attendants during the experimental period. The control group did not have the brochures handed to them nor were the signs in place along the road.

Manipulation Checks

Manipulation checks were incorporated into the survey for the experimental treatment group. Respondents were asked whether or not they noticed a sign along the GTSR that read "Bicycles May Use Full Lane" (see Appendix A for manipulation check questions). Experimental respondents were also asked if they received a yellow handout with a title reading "Bicyclists and Motorists Share Going-to-the-Sun Road." If the respondents answered yes to receiving the handout, they were then asked how thoroughly they read the handout (not at all, somewhat, or thoroughly). These manipulation checks helped to determine the sample of people from the

experimental group who were influenced by the experimental treatment. The sample that was influenced/treated had their knowledge and attitudes compared against the control group.



Figure 2. Sign and brochure used as experimental treatment conditions

Sampling and Response Rate

The sampling frame was travelers who utilized the GTSR. The respondents were individual travelers intercepted at Logan pass during two separate sampling weeks in August of 2015, and they all had experienced driving or bicycling the GTSR. August is the second highest visitor month in the park. The sampling frame was chosen so that measurements would be representative of GNP travelers who utilized the GTSR, and a general support for bicycling on the Going-to-the-Sun Road could be determined.

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Convenience sampling method was used at the Logan Pass parking area. Logan Pass is the highest point on the roadway and the spot where most visitors will stop to rest and view the scenery. Surveying at Logan Pass resulted in the greatest coverage of the population because it is the primary destination the vast majority of visitors are coming to experience.

Surveyors intercepted respondents at Logan Pass by approaching as many vehicles as possible in the Logan Pass parking area from 7:30 am until 2:30 pm daily August 13-18, 2015 (control) and August 21-28, 2015 (treatment). Two researchers each worked half of the parking area. Respondents were intercepted as they were preparing to hike or as they returned from hiking.

Two test days where refusals were tracked revealed a response rate of 84 percent. A total of 1,224 respondents completed the survey. Approximately 628 respondents were surveyed during the first control sampling week and another 597 were surveyed during the second treatment sampling week.

Limitations

This study was limited to two weeks of data collection in August, 2015. In addition, any bicyclists who rode up to the pass during the data collection weeks were all surveyed so the number of bicyclists vs. motorists is not a population count and should be used with caution. Bicyclists were intentionally targeted for testing relationships amongst variables (particularly the bicyclists' perceived interactions of motorists). A small random sample of 14 bicyclists was chosen and tested for mean differences with the full sample of bicyclists to ensure that no significant differences existed. No differences were found, therefore accurate inferences could be made about the various sub-groups using means.

Results

Demographics and Traveler Characteristics

Age, Gender, and Residence

The average age of the sample was 44 years old. Females made up 44 percent of the sample and males made up 55 percent. The majority of domestic respondents 152 (12%) reside in Montana, followed by 104 (9%) from Washington, and 79 (7%) from California. Of those from Montana who provided their county ($n = 148$), 53 percent were from Flathead County, 9 percent were from Missoula County, and 7 percent were from Lewis and Clark County. Of all the international respondents ($n = 128$), 52 percent reside in Canada, followed by 8 percent from Germany, and 9 percent from the United Kingdom. A total of 18 different countries were represented in the sample.



Figure 3. Dot density map of respondents' residences

Mobility Experience

When respondents were asked “I prefer traveling on the GTSR slowly for a better experience,” 920 (76%) indicated that they agreed or strongly agreed with the statement. Results showed that 219 (18%) respondents reported neutral while only 71 (6%) disagreed or strongly disagreed. Based on the descriptive statistics presented in Figure 4, the majority of visitors who utilize the GTSR appear to prefer traveling slowly for an improved mobility experience.

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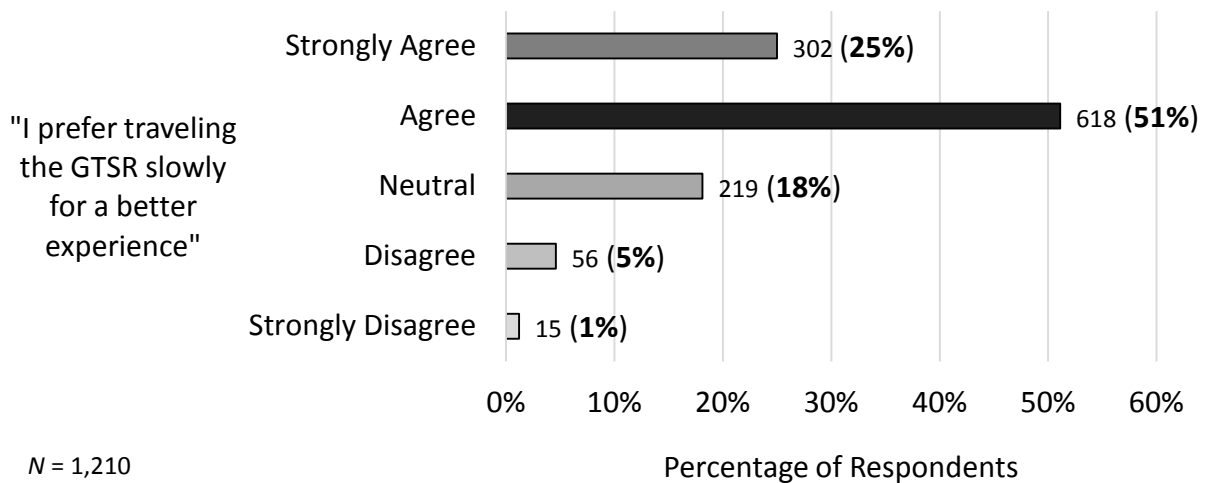


Figure 4. Preferred mobility experience on the GTSR

Transportation Mode

The sample was asked "On your way to Logan Pass today, were you primarily a... (1.) Bicyclist (2.) Driver (3.) Auto Passenger (4.) Bus Passenger." The sample consisted of auto passengers (44%), followed by drivers (39%), and then bicyclists (11%). Six percent were bus riders (Figure 5). It is important to note that these percentages are in no way representative of the mode type used by all travelers on the GTSR. The bicyclist group (11%) was intentionally overrepresented for analyzing the perceived interactions occurring between cyclists and motorists (see Methods – Limitations section). The bus passengers consisted of GNP shuttle bus passengers rather than the Red "Jammer" Bus or Sun Tours passengers. The GNP shuttle passengers were easily approachable because it is operated as a public transportation service.

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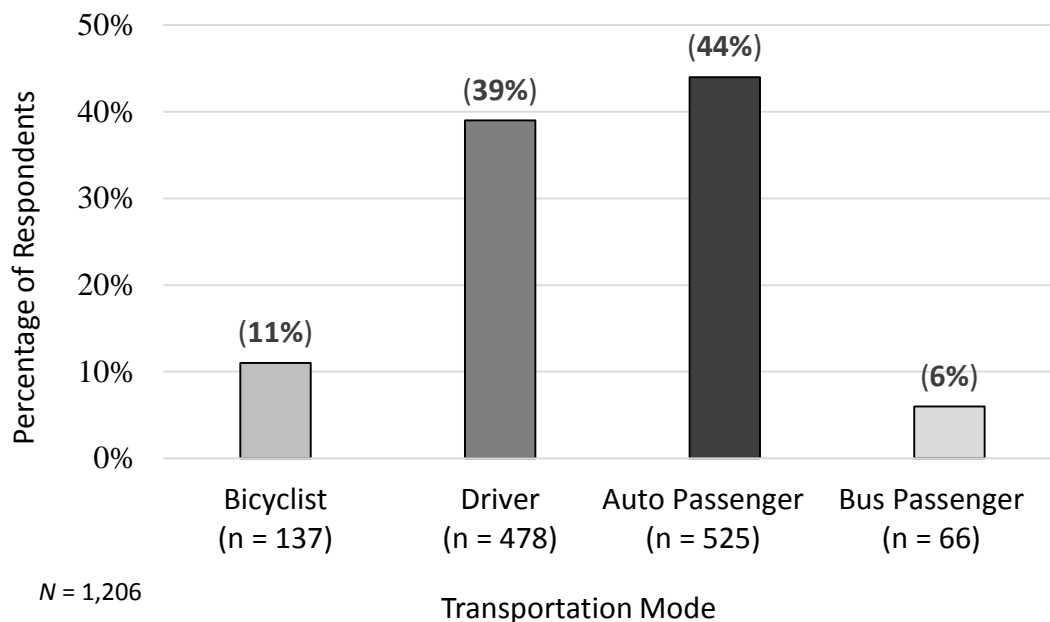


Figure 5. The primary mode of transportation respondents used to reach Logan Pass

Bicycling Frequency

The sample was categorized into three bicyclist groups and a non-bicyclist group. Of all those surveyed during the sampling periods, 82 percent of the respondents were identified as a bicyclist in one of three frequency groups and 18 percent were identified as a non-bicyclist (a non-bicyclist was anyone who had not bicycled in the last 12 months).

The majority of survey respondents identified as an occasional bicyclist (39%), followed by very frequent bicyclists (22%), frequent (21%), and non-bicyclist (18%). In figure 6, it is important to consider the over-sampling of survey respondents who physically bicycled to Logan Pass, as they made up 38 percent of the very frequent bicyclists while drivers made up 31 percent of very frequent bicyclists. Roughly nine percent of the frequent bicyclists were respondents who reached Logan Pass by bicycle, compared with 43 percent of frequent bicyclists who were drivers on their way to Logan Pass. Figure 6 simply represents the sample population used in this study. It does not represent mode types used on the Going-to-the-Sun Road.

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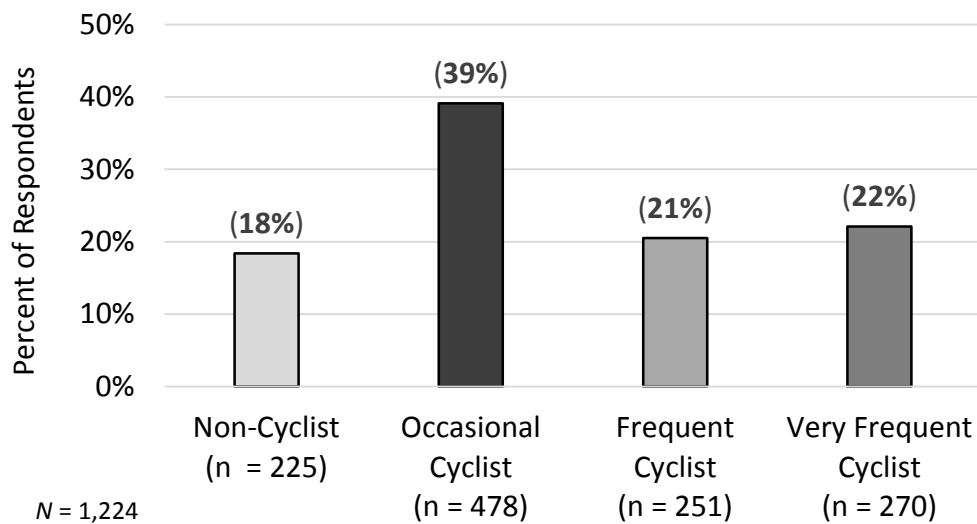
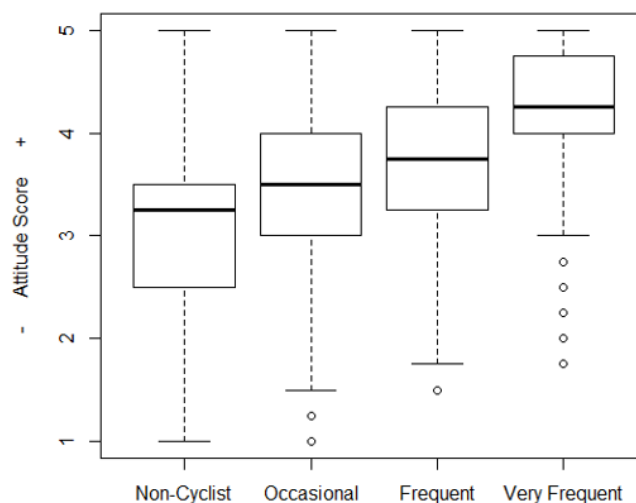


Figure 6. Percentage of respondents by bicycling frequency

Bicycling Attitudes, Perceived Behaviors, and Bicycling Frequency

The distribution of bicycling attitude scores increased steadily as bicycling frequency increased. The median bicycle attitude score was 3.25 for non-cyclists, 3.5 for occasional cyclists, 3.75 for frequent cyclists, and 4.25 for the very frequent cyclists (Figure 7). An ANOVA test found there was a significant difference in bicycle attitude scores between all combinations of groups.

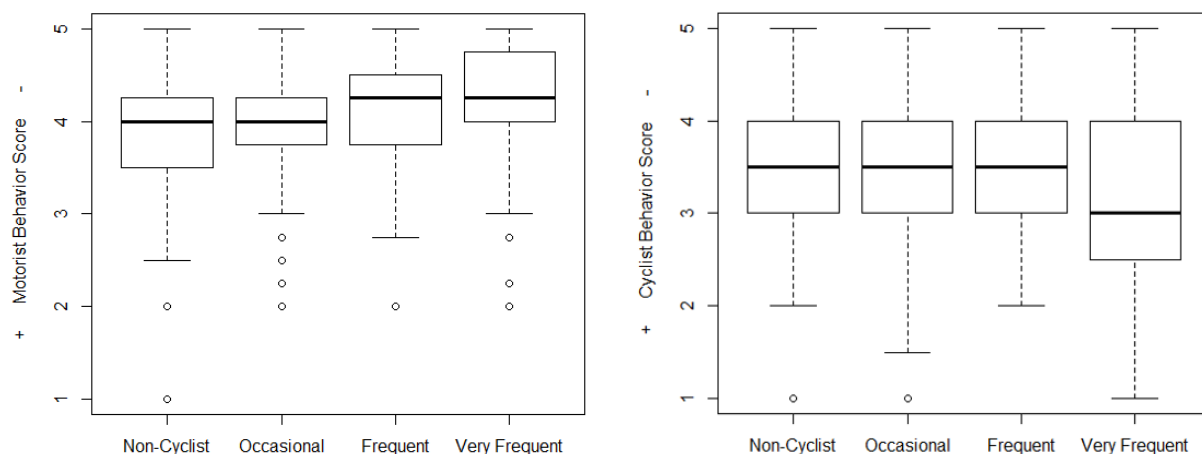


Notes: Scores closer to five represent more positive attitudes towards bicycling

Figure 7. Boxplot of the median bicycling attitude score by bicycling frequency

The distribution of motorist behavior scores increased slightly as bicycling frequency increased. The median motorist behavior score was 4.0 for non-bicyclists, 4.0 for occasional cyclists, 4.25 for frequent cyclists, and 4.25 for the very frequent cyclists (Figure 8). An ANOVA test found there was a significant difference between three sub-groups in their motorist behavior score. The very frequent bicyclists and frequent bicyclists were more critical of motorist behavior and significantly different than the other two groups. The occasional and non-cyclist groups were slightly less critical of motorist behavior, and they were significantly different from one another.

The distribution of cyclist behavior scores decreased slightly as bicycling frequency increased (Figure 8). The median bicyclist behavior score was 3.5 for non-bicyclists, 3.5 for occasional bicyclists, 3.5 for frequent bicyclists, and 3.0 for the very frequent bicyclists. An ANOVA test found there was a significant difference between two sub-groups and their bicyclist behavior score. The very frequent group was the least critical of cyclist behavior and they were significantly different than the non-cyclist group. The occasional and frequent groups did not differ significantly from the non-cyclist group, and they also did not differ from the very frequent group.



Notes: Scores closer to five represent a stronger critique of either motorist behavior or cyclist behavior.

Figure 8. Boxplots of the median motorist and cyclist behavior scores by bicycling frequency

Table 1 displays the frequency, percentages and mean scores for all attitude and behavior questions. Overall there was more criticism of motorists' behaviors toward bicyclist than the other way around.

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Table 1. *Percent and mean for bicycle attitude, motorist/cyclist behavior statements*

Bicycle Attitude	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
Bicyclists have just as much right to use the road as motorists.	30 (3%)	91 (8%)	142 (12%)	455 (37%)	499 (41%)	4.07
Bicyclists should be able to ride on main roads during high traffic times. ¹	110 (9%)	320 (26%)	267 (22%)	329 (27%)	191 (16%)	3.14
Bicyclists should not be restricted to riding paths/trails that are off streets. ¹	33 (3%)	103 (9%)	203 (17%)	502 (41%)	376 (31%)	3.89
While driving, it's not very frustrating sharing the road with bicyclists. ¹	65 (5%)	285 (23%)	320 (26%)	417 (34%)	134 (11%)	3.22
Overall						3.59
Motorist Behavior						
When possible, motorists should change lanes while passing bicyclists.	17 (1%)	46 (4%)	110 (9%)	546 (45%)	501 (41%)	4.20
Many motorists do not look out for bicyclists.	9 (1%)	143 (12%)	227 (19%)	591 (48%)	251 (21%)	3.76
Motorists should be more courteous to bicyclists on the road.	6 (1%)	28 (2%)	191 (16%)	650 (53%)	346 (28%)	4.07
Motorists should be educated about sharing the road with bicyclists.	7 (1%)	28 (2%)	108 (9%)	630 (52%)	446 (37%)	4.21
Overall						4.06
Cyclist Behavior						
Bicyclists do not ride properly on the road.	46 (4%)	354 (29%)	447 (37%)	303 (25%)	176 (15%)	3.76
Bicyclists should be more courteous to motorists on the road.	13 (1%)	98 (8%)	341 (28%)	589 (48%)	176 (15%)	2.99
Overall						3.33

Notes: The superscripted ⁽¹⁾ statements in the table reflect the reverse of how the statement was asked in the survey. See Appendix A for original statements. All statements were on a five-point Likert-scale from strongly disagree to strongly agree (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). Scores closer to five represent more positive attitudes towards bicycling. Scores closer to one represent a stronger critique of either motorist behavior or cyclist behavior.

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Bicycling Knowledge vs. Bicycling Frequency

The occasional cyclists (34%) were the most knowledgeable of the laws (legal on road, and considered a vehicle with the same rights/responsibilities as motor vehicles) compared with the remaining groups: very frequent cyclists (31%), frequent cyclists (24%), and non-cyclist (11%) (Table 2). Results show that non-bicyclists are significantly different than both the frequent and very frequent bicyclists. Occasional bicyclists are significantly different than the very frequent bicyclists.

The occasional bicyclists (33%) were the most knowledgeable of using a full lane compared with the remaining groups: very frequent bicyclists (32%), frequent bicyclists (25%), and non-bicyclist (10%) (Table 2). Significant differences were found between non-cyclists and very frequent bicyclists.

Table 2. *Bicycling knowledge by bicycling frequency*

	Non-Cyclist	Occasional	Frequent	Very Frequent
Legal on road/considered vehicle?	198 (11%)	441 (34%)	238 (24%)	247 (31%)
A bicyclist may use an entire lane?	143 (10%)	341 (33%)	184 (25%)	173 (32%)

Notes: Percentages represent those who were knowledgeable of the bicycling laws. Knowledge question Q7 – statements 1 and 3 were combined for this analysis (see survey instrument in Appendix A - Total *N* = 841. Knowledge question Q7 – statement 2 was a standalone variable for analysis (see survey instrument Appendix A - Total *N* = 1,124. Respondents who read the brochure and the sign were controlled for in these samples.

Bicycle Attitude vs. Bicycling Knowledge

Results revealed a significant difference in bicycling attitude scores between the unknowledgeable groups and the knowledgeable groups (Table 3). Respondents who are knowledgeable of the three bicycling laws tend to be more positive in their bicycling attitudes.

Table 3. *Bicycling attitude by bicycling knowledge*

	<i>N</i>	Unknowledgeable group (wrong answers) (attitude means)	Knowledgeable group (attitude means)
A bicyclist is legally entitled on the road?	1,087	3.46	3.72
Considered a veh. w/same rights/resp?	1,085	3.44	3.75
A bicyclist may use an entire lane?	825	3.53	3.84

Notes: Scores closer to five represent more positive attitudes towards bicycling

Perceived Fear vs. Bicycling Frequency

The mean perceived fear score was 4.06 for non-bicyclists, 3.85 for occasional bicyclists, 3.46 for frequent bicyclists, and 3.06 for the very frequent bicyclists (Figure 9). Perceived fear decreased as bicycling frequency increased (Table 4). An ANOVA test showed there was a statistically significant difference between all combinations of groups except the non-cyclist/occasional. The very frequent and frequent bicyclists reported less perceived fear of bicycling than the remaining groups. The overall mean score respondents reported when asked "The idea of bicycling on busy roads frightens me" (whether or not you are a cyclist) was neutral to slightly fearful ($N = 1,221$, $M = 3.64$)

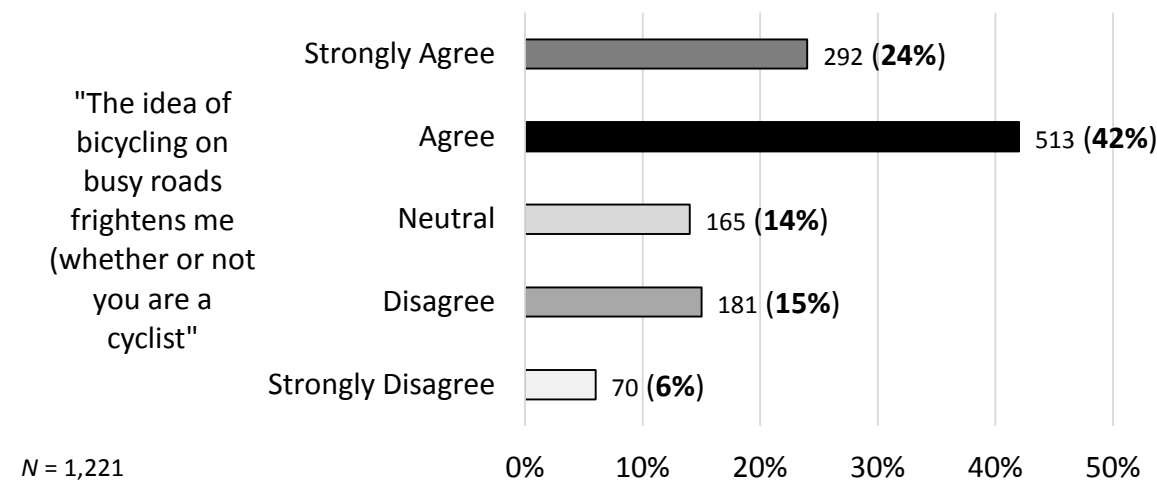


Figure 9. Perceived fear percentages

Table 4. Mean perceived fear by bicycling frequency

	Non-Cyclist	Occasional	Frequent	Very Frequent
Perceived Fear	4.06	3.85	3.46	3.06

Notes: Total $N = 1,221$. Group n ranged from 225 – 477. Perceived fear is on a 5 point Likert scale with scores close to 5 representing greater fear.

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Perceived Fear vs. Bicycling Attitude

Respondents' level of perceived fear and their bicycling attitudes were significantly correlated and showed a moderately strong inverse relationship. As perceptions of fear decreased bicycling attitudes became more positive.

Table 5. Mean perceived fear by bicycle attitude

Perceived Fear	Bicycle Attitude				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	(Negative)				(Positive)
	<i>n</i> and (%)	<i>n</i> and (%)	<i>n</i> and (%)	<i>n</i> and (%)	<i>n</i> and (%)
Mean Fear	4.71	4.42	4.00	3.46	3.02

Notes: Perceived fear is on a 5 point Likert scale with scores close to 5 representing greater fear.

Perceived Interactions on the GTSR

When bicyclists were asked "motorists appropriately passed me on the road," the majority indicated very frequently (44%) or always (20%). When bicyclists were asked "motorists did not honk, yell, or gesture at me in a negative manner" ¹, the majority indicated either always (77%) or very frequently (13%). When bicyclists were asked "motorists passed with a comfortable distance," the majority indicated very frequently (34%) or frequently (30%). When bicyclists were asked "motorists were respectful of my space," the majority indicated very frequently (38%) or frequently (32%) (Table 6).

Table 6. Bicyclists' Perceived Interactions on the GTSR

Statements	<i>n</i>	Mean
Motorists appropriately passed me	135	5.78
Motorists did not honk, yell, or gesture negatively ¹	136	6.63
Motorists passed with comfortable distance ¹	136	5.58
Motorists were respectful of my space	136	5.69
Overall		5.92

Notes: Means are on a seven-point scale and scores closer to 7 are more positive. ¹ Indicates statements are reverse coded, see Appendix A for original statements.

When motorists were asked "bicyclists did not ride two abreast" ¹, the majority indicated always (45%) or sometimes (42%). When motorists were asked "bicyclists appeared to be courteous to motorists" ¹, the majority indicated either always (52%) or sometimes

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(39%). When motorists were asked “bicyclists used a pullout when the opportunity arose,” the majority indicated N/A (43%), always (15%), sometimes (25%), or never (17%). When motorists were asked “when I passed bicyclists, I gave them at least three feet of space,” the majority indicated always (86%) (Table 7). Based on the descriptive statistics presented in Tables 6 and 7, the majority of cyclists and motorists who utilize the GTSR appear to perceive their mobility interactions as positive.

Table 7. *Motorist's Perceived Interactions on the GTSR*

Statements	<i>n</i>	Mean
Bicyclists did not ride two abreast ¹	324	2.38
Bicyclists appeared courteous	324	2.50
Bicyclists used a pullout	194	1.95
I provided 3 ft. while passing	327	2.88
Overall		2.42

Notes: Means are on a three-point scale and do not include N/A. Scores closer to 3 are more positive. The reported in-text percentages may be more appropriate for inferring about motorist perceived interactions. ¹ Indicates statements are reverse coded, see Appendix B for original statements.

Support for GTSR Bicycling, Bicycle Attitude, and Bicycling Frequency

Respondents' level of support for GTSR bicycling and their bicycling attitudes were significantly correlated and showed a moderately strong positive relationship. Support for GTSR bicycling increased as bicycling attitudes became more positive (Table 8). The overall mean score respondents reported when asked “Bicyclists should be allowed to travel along the GTSR any time of day” was neutral to slightly positive ($N = 1206$, $M = 3.18$).

Table 8. *Mean support for GTSR cycling by bicycle attitude*

		Bicycle Attitude				
		Strongly Disagree (Negative)	Disagree	Neutral	Agree	Strongly Agree (Positive)
Support for GTSR Cycling	<i>n</i> and (%)	10 (1%)	103 (9%)	334 (28%)	516 (43%)	234 (20%)
	Mean	1.92	2.36	2.76	3.31	3.99

Notes: Support for GTSR cycling is on a 5 point Likert scale with scores close to 5 representing greater support for cycling.

Respondents' level of support for GTSR bicycling and their bicycling frequency were significantly correlated and showed a weak positive relationship. Support for GTSR bicycling

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increased slightly as bicycling frequency increased (Table 9). The very frequent group was significantly different than the other three groups.

Table 9. Mean support for GTSR cycling by bicycling frequency

	Non-Cyclist	Occasional	Frequent	Very Frequent
Support for GTSR Cycling	3.01	3.04	3.17	3.58

Notes: Total $N = 1,206$. Scores closer to 5 represent greater support for GTSR cycling. Group n ranged from 224 – 469.

Experimental Results

If respondents received the brochure, a high percentage (75%) of them read it, but overall a small percentage (17%) of the total sample received the brochure. The sign was more successful as a treatment than the brochure. A total of 349 (58%) respondents from the total sample ($N = 597$) indicated they read the sign.

Control vs. Treatment – Knowledge Differences

Results showed that 16 percent of the respondents from the control group were knowledgeable that a bicycle may use a full lane and 35 percent of the treatment group was knowledgeable. There was a significant difference found between the two groups, and the sign was successful at increasing their knowledge (Table 10).

Results showed that 47 percent of the respondents from the control group were knowledgeable that a bicycle is considered a vehicle with the same rights/responsibilities and 59 percent of the treatment group was knowledgeable. There was a significant difference found between the two groups, and the sign was successful at increasing their knowledge (Table 10).

Table 10. Knowledge differences between control and treatment groups

	Control	Treatment
A bicyclist may use an entire lane?	135 (16%)	129 (35%)
A bicyclist is considered a legal vehicle with the same rights and responsibilities as a motor vehicle?	515 (47%)	57 (59%)

Notes: Percentages represent those who were knowledgeable of the bicycling laws. Control group N ranged from 841 – 1,106. Treatment group N ranged from 97 – 365.

Bicycling Restrictions on the Going-to-the-Sun Road

The map graphic in Figure 10 indicates that the Sprague Creek to Logan Creek segment is unrestricted yet has a greater elevation change (11.7%) and average slope (2%) if traveling east compared to the restricted segment of Apgar to Sprague Creek, which has a zero percent elevation change and an average slope of 1.6 percent. The Sprague Creek to Logan Creek segment has a sinuosity of .889 whereas the Apgar to Logan Creek segment has a sinuosity of .943 (Table 11). Sinuosity closer to 1 indicates that the road is closer to a straight line and values closer to 0 suggest greater deviation from the shortest path.

Table 11. *Comparison of restricted and open segments of the Going-to-the-Sun Road*

Road Characteristics (west to east)	Roadway Segments	
	Apgar to Sprague Creek (Restricted 11am – 4 pm)	Sprague Creek to Logan Creek (Open all day)
Distance	8.02 miles	10.9 miles
Elevation Gain	400 feet	755 feet
Elevation Loss	-400 feet	-382 feet
Elevation Change	0%	11.7%
Max Slope	12.3%, -17%	20.4%, -17%
Average Slope	1.6%, -1.9%	2.0%, -1.5%
Sinuosity	.943	.889
Speed Limit	40 mph	40 mph
Road Width	24 feet	24 feet

Notes: Speed limits decrease in pedestrian areas to 25-35 mph. Sinuosity measures the deviation of a line from the shortest path, dividing total length by the shortest path possible.

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Conclusion, Discussion, & Implications

Results showed that travelers of the Going-to-the-Sun Road (GTSR) have a range of backgrounds with bicycling in their daily lives, both in terms of frequency and reasons for bicycling. Glacier National Park (GNP) and other bicycle tourism planners should feel pretty confident in knowing that the majority of general park travelers are cyclists to some degree and that a cyclist vs. motorist (us vs. them) scenario does not really exist. The reality is that many drivers, motorists, and auto passengers are also occasional, frequent, and very frequent cyclists.

Bicycling attitudes improved as respondents reported greater frequency of bicycling. These results are consistent with Sander's (2013) study, and indicate to GNP and bicycle tourism planners the importance of avoiding homogenous understandings of people's bicycling attitudes. More importantly, it clearly depicts how GTSR travelers, even those who do not bicycle in their daily life, are neutral to positive in the way they legitimize cyclists on the roadway. Glacier National Park is in a position to create opportunities for travelers to engage in bicycling as an activity and the more they begin to engage in bicycling, the more positive their attitudes towards bicycling will become. The softer their bicycling attitudes become, the more supportive there will be towards GTSR cyclists, and the activity will ultimately become safer.

Overall, GTSR travelers are supportive of encouraging more courteous motorist behavior and education about sharing the road with cyclists. To summarize the motorist behavior and cyclist behavior variables, the data suggests there is bilateral support for increasing education on sharing the road and encouraging more courteous behaviors between respective transportation modes.

Perceptions of fear emerged as an important variable when analyzing GTSR travelers subjective association with roadway bicycling. If Glacier National Park wants visitors to legitimize cyclists on the roadway, then they have to create opportunities for engaging the public with the activity. The more people are involved with cycling in their daily life, the less perceived fear they will have, and the softer their attitudes will be towards the roadway cyclists who cycle the GTSR route. It is important to highlight that even the very frequent cyclists were neutral in their perceived fear of cycling on busy roads, thus supporting the notion that even the most strong and fearless cyclists are at least somewhat concerned about bicycling on busy roads. Separated facilities and opportunities to ride without motor vehicle traffic (scheduled car free days) might be one solution that GNP and other bicycle tourism planners can use to begin engaging visitors in bicycling.

The percentage of non-cyclists that were knowledgeable (a bicycle being a legal vehicle, with the same rights and responsibilities as motor vehicles, and allowed to use a full lane) was lower than the other three cyclist groups. The results showed that 16 percent of a control group was knowledgeable that a bicycle may use a full lane and 35 percent were knowledgeable after seeing the signage. It is clear that GTSR travelers who cycle at least

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occasionally are going to have greater knowledge of roadway bicycling laws which legitimize the cyclists' rights to use the road, and exposure to signage will help to increase visitor awareness of a bicycle as a legitimate road user.

People are deeply rooted in their attitudes and it may take time for accurate messaging of roadway bicycling laws before a shift in attitudes occurs. The study results did indicate that the respondents who were knowledgeable of the laws had significant improvements in their bicycling attitude scores. If GNP can create a cycling environment that legitimizes cyclists rather than prohibits them, then a change in accumulated perceptions can begin to occur. The hope then is that more positive attitudes will follow as travelers become more accustomed to seeing supportive signage rather than prohibitive signage. It is also imperative that the cyclists ride courteously to add to the shift in perceptions that motorists carry towards cyclists.

Cyclists riding to Logan Pass perceive their interactions with motorists as mostly positive, and the motorists also indicated relatively positive interactions with cyclists. Cyclists are reporting highly positive interactions, and the fact that the majority of respondents were neutral to positive in their bicycling attitudes and their support for GTSR cycling indicates that there is tolerance for GTSR roadway cycling. In light of the responses from motorists, GNP may want to consider a further investigation of cyclists riding two abreast as 42 percent of motorists indicated that happened sometimes. They also may want to encourage cyclists to utilize pullouts as a courteous behavior to further soften the relations between cyclists and motorists.

Travelers of the GTSR (76%) overwhelmingly reported that they prefer traveling slowly on the GTSR for an improved experience. This data suggests travelers are OK going slowly. With neutral bicycling attitudes and a preference to travel slowly, the occasional encountering of a GTSR cyclist should be tolerable.

The Glacier National Park website (NPS, 2016) encourages visitors to get to the pass early because Logan Pass parking area fills as early as 9:30 am during the summer months. This suggests there is a steady flow of traffic on the GTSR by 9:00 or 9:30 am during the peak season. Informal observations during this study confirm that steady flows of automobile traffic begins much earlier than 11:00 am, which helps to support the claim that the 11:00 am restriction is fairly arbitrary, not rooted in any empirical evidence, or is simply outdated. Several cyclists who were very close to reaching Logan Pass by the 11:00 am cutoff shared their stories of being interrogated by rangers and asked to turn around rather than continue to the pass. In this circumstance, both the GTSR and Logan Pass would likely be at capacity for automobile use, and traffic congestion would be similar from 9:00 am to 11:00 am or later. If steady traffic begins as early as 9:00 am, then there is no reason to turn cyclists around just before reaching Logan Pass. Another consideration is that higher density auto traffic in the 25 mph alpine section may actually be safer for bicyclists because the automobile speeds will be slower as the GTSR approaches a maximum roadway capacity.

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A visual graphic was created (see Figure 10 in Results) of the Going-to-the-Sun Road bicycling route to depict the road-segments that are restricted vs. unrestricted in relation to percentage of elevation change, average slope, and sinuosity (road length/divided by the shortest path). The restricted segment deviates from a straight line less than the open section, and from a birds eye view, does not appear to have greater curvature which would result in blind corners. Speed limits and road width are consistent through both of the segments that are in question, most often 40 mph and slowing to 25-35 mph in pedestrian areas. Road widths are a standard 24 feet and none have shoulders > 1ft. The upper alpine section above/east of Logan Creek is most often 25 mph. No data to date exists on why the western most road-segment is restricted. The map graphic along with attitudes, perceived interactions, and support for GTSR cycling provide socio-spatial evidence that the western most restriction is unwarranted.

A brief roadway scenario to consider – a cyclist who is traveling uphill/east from Sprague Creek to Logan Creek (no restriction) at 11:00 am is going to be moving slower, thus more of a hindrance to motor vehicle traffic than a touring cyclist who descends downhill/west from Logan Pass and arrives at Sprague Creek at 11:00 am needing to cycle out of the park to Apgar (restricted). Under this scenario, there are a few solutions, (1) further restrict the road to bicyclists by restricting the Sprague Creek to Logan Creek section so cyclists cannot travel the road from Apgar all the way to the pass between 11:00 am and 4:00 pm; (2) fully open the western portion of the GTSR to bicyclists from Apgar to Sprague Creek so a cyclist could go all the way to Logan Creek without restrictions; (3) completely lift all restrictions so cyclists have full right to the road anytime of day. Based on the data findings from this study, solution 3 is advisable while solution 2 is acceptable if the alpine restriction between Logan Creek and Logan Pass can be defended. If the first solution were to be implemented, it may be worth re-evaluating the timeframe to better reflect actual motor vehicle flows. One alternate solution to consider is to leave the restrictions as is. The status quo would likely continue to leave visitors confused about the restrictions and will ultimately discourage them from engaging with cycling while visiting Glacier National Park.

After speaking directly to many cyclists who utilized the GTSR in 2015, the majority prefer to cycle in the morning hours rather than the heat of the day, so it is unlikely that there would be a major spike in bicycle travel if all the restrictions were lifted. If an occasional touring cyclist needs to descend from Logan Pass and arrives at Sprague Creek around 11:00 am traveling west, then they should not have to wait 4 hours to exit the park. Similarly, a touring cyclist who arrives at Apgar on their bicycle and needs to enter the park should also not have to wait. Glacier National Park and Montana are fortunate to be situated on one of the nation's premiere trans-national bicycle routes. Touring cyclists passing through on the GTSR should not be faced with restricted mobility so that preference can be given to unimpeded auto-tourists. Glacier National Park is faced with the decision of catering to and celebrating bicycle tourists, or continuing on with restrictions which create mobility unevenness.

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Concluding Remarks

Glacier National Park at a minimum should consider unrestricted bicycle travel on the western portion of the GTSR based on the analysis of the different segments' road characteristics and the attitudes towards cycling data. Restricting bicycles does not align with the 49 of 50 state laws across the country that recognize a bicycle as "having all the same rights and duties as a driver," nor the majority of states that recognize a bicycle as a legal vehicle. Furthermore, neutral to positive bicycling attitudes, neutral support for GTSR cycling, slow travel preferences, and the overwhelmingly positive interactions that are occurring between cyclists and motorists suggests that a restriction against cycling is not warranted.

Glacier National Park has a tremendous opportunity to celebrate the longstanding tradition of bicycle travel in America. By engaging travelers with bicycling as a form of mobility, one can effectively re-define places and re-produce mobility feelings and socio-spatial processes. There are an increasing number of people who are taking interest in bicycling and it could lead to new social relations in GNP. As society shifts towards more of a non-motorized mobility acceptance, Glacier National Park may see a re-produced and re-constructed tourism



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space and lived mobility experience, thus resulting in new mobility meanings along the Going-to-the-Sun Road.

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Appendix A

Traveling Along the Going-to-the-Sun Road

Instructions: We are interested in your attitudes about bicycling and interactions that occur between bicyclists and motor vehicles. Please answer the following questions.

Q1 Have you ridden a bicycle in the past 12 months? ☐ Yes ☐ No (if no, skip to Q5)

Q2 I ride a bicycle... ☐ Occasionally ☐ Frequently ☐ Very frequently

Q3 For what reasons do you bicycle? (Please "X" all that apply.) ☐ Commuting/Transportation ☐ Recreation

Q4 Generally, I bicycle about: ☐ 1 time/year ☐ 1 time/month ☐ 1-2 days/week ☐ 3-4 days/week ☐ 5-7 days/week

Q5 In my daily life, I believe that:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Bicyclists have just as much right to use the road as motorists.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicyclists should not be able to ride on main roads during high traffic times.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When possible, motorists should change lanes while passing bicyclists.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Many motorists do not look out for bicyclists.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicyclists should be more courteous to motorists on the road.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicyclists do not ride properly on the road.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motorists should be educated about sharing the road with bicyclists.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
While driving, it is very frustrating sharing the road with bicyclists.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicyclists should be restricted to riding on paths or trails that are off-streets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motorists should be more courteous to bicyclists on the road.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicyclists should be educated about sharing the road with motor vehicles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The <u>idea</u> of bicycling on busy roads frightens me. (Whether or not you are a cyclist.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please rate your level of agreement with the following statements:

I prefer traveling the GTTSR slowly for a better experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicyclists should be allowed to travel along the GTTSR any time of day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q6 I have bicycled the Going-to-the-Sun Road... (Think of all trips and please "X" all that apply.)

☐ N/A - I have not bicycled the Going-to-the-Sun Road. ☐ with motor vehicles on the road. ☐ without motor vehicles on the road.

Q7 In Montana...

	Yes	No	I don't know
A bicyclist is legally entitled to ride on the roads.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A bicyclist may use an entire lane.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A bicycle is considered a vehicle and has the same rights and responsibilities on the road as a motor vehicle.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Q8 On your way to Logan Pass today, were you primarily a... (Please "X" only one.)

- ☐ Bicyclist (go to Q9) ☐ Driver (skip to Q10) ☐ Auto passenger (skip to Q12) ☐ Bus passenger (skip to Q12)

Bicyclists Only

Q9 Along the Going-to-the-Sun Road today:

	Never	Very infrequently	Infrequently	Neutral	Frequently	Very frequently	Always
Motor vehicles appropriately passed me on the road.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motorists honked, yelled, or made a gesture at me in a negative manner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motor vehicles passed uncomfortably close to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motorists were respectful of my space while I was bicycling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Now, please proceed to Q12.)

Drivers Only

Q10 I encountered bicyclists riding along the Going-to-the-Sun Road today. ☐ Yes ☐ No (if no, skip to Q12)

Q11 Along the Going-to-the-Sun Road today:

	Never	Sometimes	Always	N/A
I encountered bicyclists riding side-by-side in a traffic lane.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I encountered bicyclists who appeared to be courteous to motorists.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicyclists used a pullout when the opportunity arose.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I passed bicyclists, I gave them at least three feet of space between my vehicle and their bicycle.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q12 Did you receive the following handout at the entrance gate? "Bicyclists and Motorists share Going-to-the-Sun Road"

- ☐ Yes ☐ No ☐ I don't know

Q12a If yes to Q12, how thoroughly did you read the handout?

- ☐ Not at all ☐ Somewhat ☐ Thoroughly

Q13 Did you notice the following sign along the Going-to-the-Sun Road? A white, rectangular road sign that said: "Bicycles May Use Full Lane, Pass 3ft Min"

- ☐ Yes ☐ No ☐ I don't know

Q14 What is your gender? ☐ Female ☐ Male

Q15 What is your age?

Q16 In what state, Canadian province, or other country do you permanently reside?

Q17 If a Montana resident, in what county do you permanently reside?

Thank You!

Figure A1. Survey Instrument

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