Mount Baker-Snoqualmie National Forest Winter Aalternative Transportation Study

MOUNT BAKER-SNOQUALMIE NATIONAL FOREST WINTER ALTERNATIVE TRANSPORTATION STUDY

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Abstract
The primary focus of this study was to evaluate recreationists' perceptions, motivations and interests related to potential alternative transportation systems on the Mount Baker-Snoqualmie National Forest (MBSNF), near the Seattle Metro area, one of the most visited National Forest units in the country. This study yielded 261 completed surveys, using face-to-face interviews with visitors, conducted onsite in the winter 2013 recreation season. Nearly all of the visitors (98.9%) were visiting on day trips and travelled by private vehicle or motorcycle (100.0%) to and within the Forest. In regards to the use of specific services desired, visitors responded that they were most likely to use online info or apps (mean = 4.28). A majority of visitors (55.1%) said that they were interested in a public transportation to ski areas. The vast majority of respondents (90.3%) were willing to pay from $1 to $30 for a pass to the Forest from population centers.

1.0 Introduction
The Mount Baker-Snoqualmie National Forest is located in the state of Washington. Its 1.7 million acres extends from the British Columbia border (Canada) to the vicinity of Seattle. Seattle hosts many important and unique companies such as Boeing, Starbucks and Microsoft. Benefiting from a higher elevation, the MBS offers Seattle's population the opportunity to recreate in a different climate (more sunshine) within a relatively close distance. For instance, Interstate 90 allows Seattle's inhabitants to reach the forest within thirty minutes. As a result, the MBS National Forest represents one of the most visited forests in the United States, with more than 2 million visits per year (USFS, 2014). The facilities within the forest include more than 1506 miles of trails, four ski resorts and snow-parks and many opportunities to participate in recreational activities such as wildlife watching, canoeing or fishing. The Forest can be used all year, as there is four-season use. Because of this heavy use, parking is limited and traffic jams occur regularly within the area. In order to remediate to this situation, the US Forest Service Pacific Northwest Regional office (Region 6) engaged in a study to assess the implementation of an Alternative Transportation System at the MBS. Working together with West Virginia University researchers, this paper presents the results of the winter study that were realized as part of this larger study. Thus, the main purpose of this study is to assess whether recreationists are interested in an Alternative Transportation System.

1.1 Background
An Alternative Transportation System is not solely a shuttle system, but also comprises different tools to facilitate transportation within a determined area. Originally, the U.S. Department of transportation developed a program named Transportation Alternatives

Program (TAP) that consists on a fund to grant projects regarding improvements of transportation systems and projects that offer transportation alternatives. This program aims at improving mobility, safety for communities and at enhancing the environment (US Department of Transportation, 2014b). The TAP fund participates in creating/improving transportation linked with recreation. New technologies are especially an important component of the equation, by integrating live information to manage parking shortages and to communicate live traffic information (US Department of Transportation, 2014a). They are part of the Intelligent Transportation Systems program (ITS) developed by the U.S. Department of Transportation that focuses on improving networks at the Nation's scale, notably in terms of mobility and safety (US Department of Transportation, 2014a). Using the newest technologies available the ITS enables to manage traffic and offers drivers with precise information on road conditions. Further development would give new perspectives in parking management (e.g. where to park).

The literature indicates that if people are generally satisfied with their recreational experience, their travel experience to recreational areas is poorly rated (Zimmerman *et al.*, 2003; Daigle & Zimmerman, 2004). Dealing with traffic jams or finding a parking spot can add stress to the travel (Daigle & Zimmerman, 2004). The impact of the congestion is linked with the theory of crowding. Crowding is seen as an impact that negatively affects recreationists' experiences (Shelby *et al.*, 1989). Daigle & Zimmerman (2004) have shown that most recreationists made use of the ITS to receive live information about parking shortages at Acadia National Park. Their study was conducted in 2002, more than 12 years ago. Since this time, technology use has drastically increased together with innovation. For example smartphones and their applications are highly used nowadays.

The heavy use of the Mount Baker-Snoqualmie National Forest has led the managers of the USDA Forest Service from the Pacific Northwest Regional office (Region 6) to assess the feasibility of an Alternative Transportation System. It would potentially lessen the congestion that occurs on the I-90 on high-use days. It would also participate in environmental mitigation by reducing greenhouse gas emissions. Another reason why the regional office wants to understand the role of an Alternative Transportation System is the fact that most recreationists visiting the MBS are white Caucasians, not representing the racial diversity of the Seattle metro area (Covelli *et al.*, 2007). The development of the Alternative Transportation System would eventually set opportunities for communities to get to the MBS.

Therefore, the questions that were asked by the managers were: What are the profiles of the recreationists? Are they interested in an ATS? How much recreationists are willing to pay for such a system?

2.0 Methods

Data were collected by West Virginia University (WVU) researchers during the winter season of 2013, primarily over the Martin Luther King week-end, where a high level of use was expected. The data collection occurred at different parking lots and times over the week-end. Interviews were conducted at the Summit Resort, Alpental Resort, Gold Creek Sno-Park and Hyak Sno-Park located along the interstate I-90 representing the most accessible recreational areas from downtown Seattle (only 30 minutes by car). Researchers conducted voluntary-based questionnaire surveys. This survey instrument was designed in collaboration with the Pacific Northwest Regional office (USFS). A total of 261 questionnaires were collected over the week-end.

A first part of the questionnaire consisted of general questions to better understand who the recreationists that come to the Forest are. People were asked to tell what activities they were

participating in. For this purpose, they could choose different options among: Skiing/Snowboarding, Cross country skiing, Snowmobiling, Sledding/tubing, Day hiking/walking/snowshoeing, Snow play, Snow viewing (looking at snow). Respondents were asked to rate their level of satisfaction regarding their experience using 6-point Likert scale, with 1 being 'poor' and 6 being 'perfect'. They were also questioned about their motivations to visit the forest, using 5-point Likert scales, listing different options. Interviewees were asked to mention the mode of transportation they used to arrive at the forest and whether they used information about the Forest before they came. Adding to this, certain demographic questions were also asked, such as age, racial group, or income level.

In a second stage and as the focus of this study, respondents were asked a set of questions regarding their motivations and interests in an Alternative Transportation System. 5-point Likert scales were used to determine the likeliness to use the different features offered by the Alternative Transportation System. Respondents were also asked to determine what factors may alter their choice in using the ATS.

A last section of the survey asked the respondents to determine how much they were willing to pay for a transportation system (e.g., shuttle, expanded local bus system, etc.) within and to the forest. Within this paper, the data analysis is essentially descriptive and focuses on percentages and means.

3.0 Results

This section exposes the results obtained with the questionnaire surveys. It is organized as follow: user characteristics, interest in an Alternative Transportation System and willingness to pay for an ATS.

3.1 User characteristics

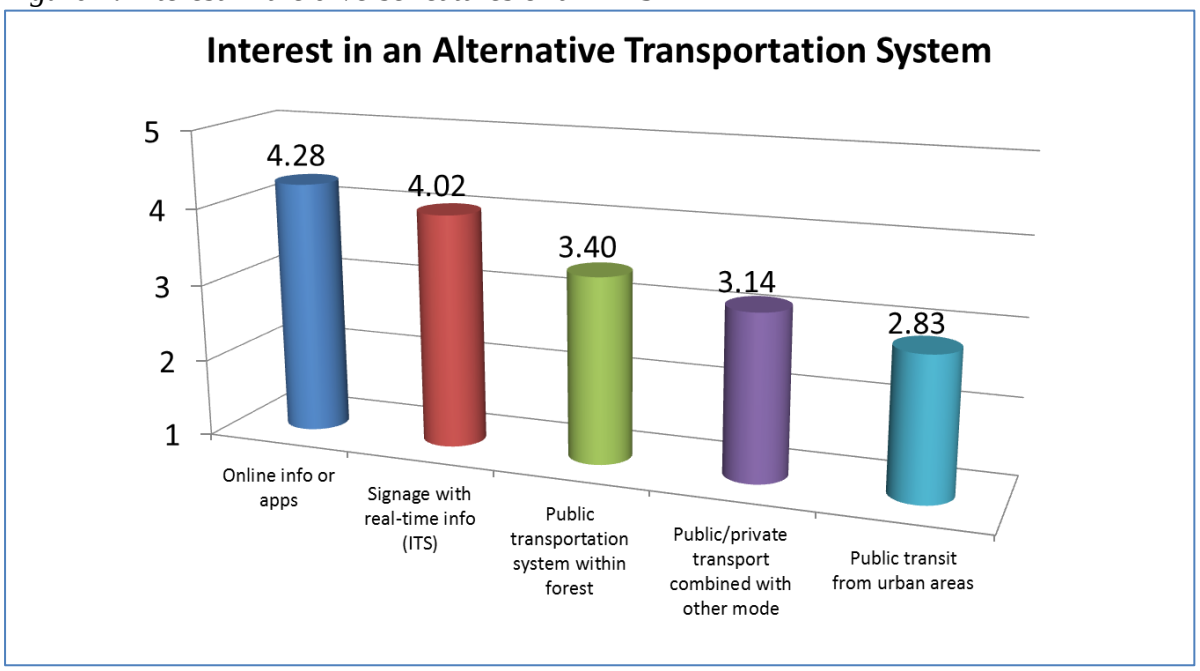
Examining the results of the 261 persons interviewed, it appears that more than half of the respondents (52.6%) were aged between 21 and 40 years old. Over a third of them (37.7%) had a Master's degree or higher, indicating a rather high level of education. In addition, one-fourth (23.9%) of the recreationists specified that they earned $100K-$149K per year. Since the survey took place in the winter season, a wide majority of the sample (55.2%) came to ski or snowboard, while a fourth (23.6%) came to sled/tube; over a fifth (22.7%) came to hike, a minor proportion did cross country skiing (11.2%) and another one played in the snow (11.6%). On average, people spent about 5 hours in the Forest to participate in different activities. In order to know why people visited the Forest, on a 5-point Likert scale, respondents indicated that spending time with friends (mean = 4.22), family (mean = 4.10) and getting exercise (mean = 4.11) were the most important reasons to visit the Forest. Using a 6-point scale, recreationists said they were very satisfied with their visit (mean = 4.65). Regarding the planning of the trip, a majority (59%) of the visitors planned their trips 3 days in advance. Nearly all the respondents were on a day-trip visit (98.7%) and 100% of them used their own vehicle to come to the Forest. Almost all were repeat visitors (92.7%) and nearly half (45.7%) did not use any information about the area before they came. For instance, the majority of the people lived within 50 miles of the Forest perimeter; only two people lived outside of this area. Most of the people were Caucasian (86.9%), while 4.0 % of the visitors were of Hispanic, Latino or of Spanish origin. Other races represented in the sample included Japanese (1.6%), other Asian or Pacific Islander (1.5%), Asian Indian (1.2%), Black or African American (0.8%), Vietnamese (0.8%), and Korean (0.4%).

3.2 Interest in an Alternative Transportation System

Respondents were asked how likely they would use different features from the ATS. In that sense, figure 1 illustrates the level of interest on a 5-point Likert scale. The diverse means

indicate that people are generally interested in the features proposed by the ATS. According to figure 1, it is possible to notice that recreationists had the greatest interest in online information and applications (mean = 4.28) and real time information (ITS) (mean = 4.02). Transportation systems based on shuttles showed high means but indicated less support. The system of transportation within the forest (mean = 3.40) had more support than the system of transportation from urban areas to the forest (mean = 2.83).

*Figure 1***.** Interest in the diverse features of an ATS



Researchers were particularly interested in knowing where people were willing to go to when interested in a shuttle service. Respondents could select different options simultaneously. If 24% of the respondents were not interested in the shuttle system, 55% of the respondents indicated they wanted to go to ski areas, 49.9% wanted to reach the snow-parks and 44.1% indicated they wanted to go to trailheads. Other locations included overlooks (12.2%), campgrounds (22.8%), visitor centers (15.4%) and picnic areas (13.8%).

The study also aimed at understanding what factors may influence recreationists' interest in the ATS. Respondents were asked to rank the three main reasons that would influence their choice for the ATS among parking shortages, traffic, weather conditions, interpretation, group/social travel, cost, schedule, environmental impact, transport of recreational gear, safety related to weather and safety related to other issues. Parking shortages and schedule appeared to be the first two reasons that would influence the use of the ATS, while costs and traffic seemed to be the second two major reasons to influence the ATS use. The other factors were judged less important.

3.3 Willingness to pay for the ATS

This study sought to determine how much people were willing to pay for a shuttle service. It appeared that while 7.9% of respondents did not want to pay to get from the city to the forest, 90.3% of them were willing to pay $1 to $30 for this shuttle service. About two-third of the respondents (67.8%) of them were willing to pay $1 to $10 to get a shuttle within the forest and 13.5% of the respondents did not want to pay for this service within the forest.

4.0 Discussion

In light of the previous results, it is possible to affirm that there was a wide interest in the Alternative Transportation System proposed within this survey. This is important knowing that most respondents were repeat users using their own car to visit the forest. Knowing that traffic, cost, schedule and parking shortages are the most important factors that would influence visitors' choice to use the ATS show that there is a need for such a system. Daigle (2007) and White (2007) both insist on the need for reliability on the ATS to provide services and that would trigger the use and existence of such a system. If the people cannot find accurate information, the people will stop using it. Besides, these two authors also highlight the fact that recreationists' environmental values may influence the support for such a system. White (2007) affirms that perceived freedom that cars offer is something to take into consideration when setting up an Alternative Transportation System, and that some people may not be interested in shuttles for that particular reason. Thus, the flexibility of such a system in terms of timing and access points is crucial (White, 2007). Regarding the fact that ethnicities are under-represented within National Forests (confirmed in this study) (Covelli *et al.*, 2007) and that transportation is a trigger to this phenomenon, it would be interesting to see whether an ATS would increase racial diversity visiting the National Forest. More research and further statistical analysis should be realized to better understand the aspects in the interest of an Alternative Transportation System.

5.0 References

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