2020

Shuttles in Wonderland: Assessing the Perceived Impact to Residents' Quality of Life Based on the Proposed Implementation of a Voluntary Shuttle System in West Yellowstone, MT

Carter Wyatt Bermingham
University of Montana, Missoula

Shuttles in Wonderland: Assessing the Perceived Impact to Residents' Quality of Life Based on the Proposed Implementation of a Voluntary Shuttle System in West Yellowstone, MT

Carter Bermingham

M.S. Parks, Tourism, & Recreation Management

W.A. Franke College of Forestry and Conservation

University of Montana

Dr. Norma Polovitz Nickerson, Chair

Department of Society and Conservation,

Dr. Jeremy Sage

Department of Geography,

Dr. Jakki Mohr

Department of Management and Marketing

Bermingham, Carter, M.S., Spring 2020 Parks, Tourism, and Recreation Management

Shuttles in Wonderland: Assessing the Perceived Impact to Residents' Quality of Life Based on the Proposed Implementation of a Voluntary Shuttle System in West Yellowstone, MT

Chairperson: Dr. Norma P. Nickerson

As visitation to the national parks across the United States continues to increase, more and more park service units are exploring the possibility of implementing alternative forms of transportation to help mitigate some of the negative side effects associated with vehicle-related congestion issues. Although research efforts have examined the role of alternative transportation systems (ATS) in helping to improve the visitor experience in the national parks, fewer research efforts have focused on the impacts of these transportation systems on the affiliated gateway community, particularly with respect to the perceived impacts an ATS may have on quality of life in gateway communities.

Using West Yellowstone as a case study, this research aimed to address the gap in understanding residents' current perceptions of the community's quality of life (QOL), but more precisely, understanding how a hypothetically proposed form of tourism development (a voluntary shuttle system) could impact perceptions of QOL. Results show that characteristics of West Yellowstone's community that contribute to a high QOL are environmental factors like clean air, clean water, and opportunities for outdoor recreation. Conversely, residents expressed concerns over the lack of affordable housing within their community.

When assessing the perceived impact a shuttle system would have on their QOL, residents felt that it would enhance several characteristics of their community that were already contributing to a high QOL while exacerbating fewer, yet highly important issues that were detracting from it. Overall, residents displayed tepid support for the concept of a shuttle system that would originate within their community. Rather, residents wished to focus on issues that were currently detracting from their QOL, such as the lack of affordable housing in their community. It is recommended that the idea of a shuttle system that originates within the town of West Yellowstone be pursued with caution until more pressing social and economic issues are handled first, if a shuttle system is to be pursued at all.

Acknowledgments

First off, I would like to thank my committee chair Norma Nickerson for her guidance and expertise throughout this process. Without all her countless hours assisting in the survey design, editing of documents and drafts, meetings, and zoom calls, this project would not have been achievable. Working with Norma has provided me with a wealth of opportunities to conduct research on recreation in a state I am fortunate enough to call home. I would also like to thank my other past and present committee members Jakki Mohr, Jeremy Sage, and Bill Borrie. Jakki's assistance on statistical analysis has been invaluable, along with her constant encouragement and availability. Jeremy's expertise in the field, particularly the transportation field, was essential to understanding the dynamics of how a shuttle would operate within a gateway community. Bill's unique recreation expertise along with his Socratic style of inquiry without a doubt produced some of the most thought-provoking discussions I've been fortunate enough to take part in during my time in graduate school.

To all the amazing people I've had the pleasure to work with at ITRR, thank you for making this experience truly one of the greatest times and experiences of my life. When I reflect back on where I've come in the past two years, I owe it in large part to the people around me who were always willing to lend a hand or an ear.

I would also like to thank all the professors I had the pleasure of interacting with at the College of Forestry and Conservation. I thank you for teaching and equipping me with the necessary skills to understand complex issues in our natural and protected areas.

Thank you to all my friends and loved ones for supporting me through these past two years. The social hours following seminars, the Society and Conservation Department events, open mic nights, and the general pleasant company have been such a welcome reprieve during such times of stress.

I would also like to extend a big thank you to Marysue Costello and her husband John. The Costello's were not only kind enough to assist me in developing my surveying plan, they also gave me a place to stay in their home while I was in West Yellowstone surveying. That sort of kindness cannot be overstated, and I'm thankful that people like the Costello's are so willing to lend a helping hand.

Finally, I would like to thank my family. My parents Lloyd and Doreen Bermingham have shown me nothing but support throughout my life, and their love and confidence in me has been a blessing. Most importantly, though, I would like to thank my fiancé, Sara Grimes. She has been without a doubt the greatest thing that has ever happened to me in my life, and the thought of knowing the rest of our lives together lies ahead is enough to endlessly motive me to be a better man.

Contents

Introduction

As visitation to the national parks across the United States continues to increase, more and more park service units are exploring the possibility of implementing alternative forms of transportation to help mitigate some of the negative side effects associated with vehicle-related congestion issues (Daigle, 2015). Some of those side effects include: increased congestion on roadways, reduced availability of parking, habitat degradation, and increased air and noise pollution, all of which have been shown to negatively impact the visitor experience (Ament et al. 2014; Daigle, 2015). For Yellowstone National Park, and West Yellowstone in particular, this story is no different.

Long before West Yellowstone was an incorporated community it reigned supreme as the busiest entrance into Yellowstone National Park (YNP), serving and accommodating tens of millions of guests over the last century (Shea, 2009; Yellowstone Historic Center, 2019a). As a gateway community, West Yellowstone is familiar with issues such as crowding and congestion that can be attributed to peak season visitation in YNP. To combat these issues, the National Park Service has used alternative transportation systems as management tools in the attempt to improve the visitor experience within the parks (Bryne and Upchurch, 2014; Daigle, 2015; Mace, 2014). In 2018, 95 transit systems operated in 60 park units nationwide (Pildes et al., 2019).

Although research efforts have examined the role of alternative transportation systems (ATS) in helping to improve the visitor experience in the national parks, fewer research efforts have focused on the impacts of these transportation systems on the affiliated gateway community, particularly with respect to the perceived impacts an ATS may have on quality of life in gateway communities. Gateway communities are significant stakeholders in the larger discussion of natural resource policy and management. Creating, communicating, and

establishing clear goals with and for gateway communities interested in implementing ATS are key components to developing support for management decisions and for successfully transitioning to alternative forms of transportation, if that is what is desired by the parties involved. As a quasi-form of tourism development, ATS encompass a range of opinions and attitudes from individuals who have experienced them personally or have heard second hand about their impact. Understanding these attitudes towards ATS and tourism development, particularly before any development takes place, can provide useful information towards understanding how desired and effective a potential shuttle system may be from the perspective of the citizens in the gateway community.

Using West Yellowstone as a case study, this research aimed to address the gap in understanding residents' current perceptions of the community's quality of life (QOL), but more precisely, understanding how a hypothetically proposed form of tourism development (a voluntary shuttle system) could impact perceptions of QOL.

1) How do residents of West Yellowstone, MT currently perceive their quality of life?
2) How does the hypothetical implementation of a voluntary shuttle system originating in West Yellowstone affect residents' perceptions of their quality of life?
3) To what degree does the residents' relationship to the tourism industry predict their perceptions of how a shuttle would impact their future QOL?

The research findings provide managers in Yellowstone National Park, as well as community leaders and citizens of West Yellowstone, with information specifically addressing current perceptions of quality of life, possible impacts to quality of life as a result of the implementation of an ATS, as well as residents' general attitudes towards tourism and tourism development. In addition, the research findings could provide a template for other national park gateway

communities interested in exploring how ATS may affect perceptions of their communities' quality of life prior to their implementation.

To set the context for West Yellowstone and its relationship to Yellowstone National Park and regulation, the next several pages provide historical information pertinent to this discussion and study. When assessing any transportation issues in West Yellowstone, be it winter or summer, it is important to understand the area's history in order to fully appreciate any concerns the community may have when considering alternative forms of transportation into YNP. Following the necessary historical background, the format will return to a more traditional thesis and literature review.

History of West Yellowstone

As is the case with most history in Montana, the story of West Yellowstone begins long before first contact from the Anglo-American world. For over 8,000 years, 25 Native American tribes frequented the area, using the Madison River as a guide to and from the heart of what is today YNP (Shea, 2009). Early trail systems used by Native Americans at the time, like the Bannock Indian Trail, make up today's highway system that leads guests to YNP (Shea, 2009). Formerly known as Boundary, Riverside, and Yellowstone, West Yellowstone has a long history of catering to the wants and needs of visitors to YNP. Beginning soon after the legal designation of YNP in 1872, development began in order to facilitate travel via wagon and stagecoach into the Park. By 1880, a road from Virginia City, Montana to YNP was well established (Shea, 2009). By 1905, the Union Pacific Railroad had arrived, connecting eastern Idaho and western Montana with the cleverly named stage and mail stop Monida, currently on today's I-15 corridor. The line was completed in late 1907, with the first passenger trains arriving in West Yellowstone on June 11th, 1908 (Shea, 2009).

With the arrival of the railroad, a nascent town began to emerge. As entrepreneurs began to stake their claims in the area, the need for more facilities and accommodations followed suit. Due to the town's location within national forest land, families were obliged to lease land from the US Government in order to establish their businesses. By 1913, the town had 50 buildings and 13 separate leaseholders in the area (Shea, 2009). As the town continued to grow and develop in the early 20th century, the official authorization of automobile use in YNP in 1915 would usher in the dominating force that would soon come to shape the landscape (Yellowstone Historic Center, 2019b). By the fall of 1916, it was evident that the old forms of transportation (stagecoaches, wagons, and horseback) were not capable of coexisting with the newly invented automobile, and prioritization was given to the latter in future development considerations. By 1920, legislation signed by then President Woodrow Wilson removed the town from the national forest, freeing West Yellowstone from the restriction of federal government and allowing them to take more agency over their future (Shea, 2009).

In this transportation reprioritization, the Yellowstone Park Transportation Company - working in conjunction with the White Motor Company of Cleveland, Ohio - obtained exclusive rights to operate 116 motor buses that would comprise the new public transportation system. The Yellowstone Historical Society explains that, "While the vehicles themselves were not unique, their livery of English Coach Yellow with black trim, the sheer size of the fleet, and the operating conditions at Yellowstone attracted the attention of tourists and industry observers alike" (Yellowstone Historic Society,

Figure 1: Shuttle Bus in Early 20th Century West Yellowstone (Image Courtesy of the Yellowstone Historic Center,2019b)

2019b). Although the fleet of buses would reach its pinnacle in 1936 with 325 vehicles, the increasing popularity of the automobile, followed by the end of World War II, would lead to the decline in popularity of both train and bus travel for West Yellowstone (Yellowstone Historic Society, 2019b). The next several decades would also welcome further infrastructure developments, such as paved highways on the north and south ends of town, an airport, gas stations, restaurants and hotels (Yellowstone Historic Society 2019c).

Although West Yellowstone was officially removed from the then Madison National Forest in 1920, the town did not officially become incorporated until June 6th, 1966 (Yellowstone Historic Center, 2019a). That very same day, West Yellowstone's first bank opened for business, giving the town a post office, private land, a school, and a bank. This transition gave the town final control over its destiny and localized decision-making power in the community instead of the distant Gallatin County (Yellowstone Historic Center, 2019a). As a gateway community to YNP, West Yellowstone continued to thrive as the Park (and the national parks in general) grew in popularity, although its economic success was limited due to the seasonal window that accompanied summer visitation.

In 1971, YNP experimented with its first official winter season, allowing over-the-snow machines to enter the park (Shea, 2009). Although guests had long toured the park via snowshoes, cross-country skis, and make-shift snow machines, their access to West Yellowstone during the winter months leading up to 1971 was rather limited due to logistical constraints in travel (such as snow removal) that barred visitors from easily reaching the community to begin with (Yellowstone Historic Center, 2019d). This newly welcomed mode of transportation and season of visitation in the park all but ended winter isolation in West Yellowstone, creating more year-round tourism in the community.

Beginning in the early 1990s (the first years with robust data collection on park entries), the number of visitors entering the park via the West Gate by snowmobile or snowcoach began to exceed 40,000 visitors during the first three months of the year (National Park Service, 2020). However, due to the Park's management actions in the early 2000s designed to reduce conflicts between winter visitors and wildlife, the number of visitors to West Yellowstone during the winter season decreased significantly. For the first three months of 2002, West Yellowstone observed 42,071 snowmobilers enter through the West Gate. By 2004, the number of snowmobilers who entered during that same period dropped 70 percent to 12,421, figures that have remained constant over the last 16 years (National Park Service, 2020). In 2019, roughly 13,000 snowmobiles entered for the first three months of the year. As the town of West Yellowstone pointed out in the draft of its growth policy for 2018 during a town council meeting, "Fifteen years ago, there were numerous changes in winter usage in Yellowstone National Park that produced catastrophic impacts in the town's winter economy… After many years of trying to rebuild the winter economy, the town continues to struggle to attract visitors in the spring and fall shoulder seasons" (Town of West Yellowstone, 2017, p.18). When assessing any transportation issues in West Yellowstone, be it winter or summer, it is important to understand the history that accompanies the area in order to fully appreciate any concerns the community may have when considering alternative forms of transportation into YNP.

West Yellowstone Today

According to the most recent data provided by the U.S. Census Bureau (2010), West Yellowstone has a population of roughly 1,100 year-round residents, with a median age of 44 years old (U.S. Census Bureau, 2010). In total, there are 910 housing units in the town, with households reporting a median annual income of $32,316 (12 percent of individuals are considered to be living below the poverty line) (U.S. Census Bureau, 2010). However, between mid-April and late October, West Yellowstone accommodates close to 1.9 million tourists, representing 42 percent of all entries into YNP (Town of West Yellowstone, 2017). In 2019, the total number of vehicles that entered through the West Gate (snowmobiles and snowcoaches included) tallied 600,880 with 378,403 (63%) of those entries occurring between the months of June and August, and 543,464 entries (90%) occurring between the months of May and September (National Park Service, 2020). Hotels and restaurants are flooded with guests, as the town's population can rise to 10,000 people on any given night during the summer months (Town of West Yellowstone, 2017).

Figure 2: West Gate July 29, 2015 (Image taken by Jim Peaco Courtesy of Yellowstone National Park)

Figure 3 shows the current layout of the town, with a dashed line delineating the official boundary of the incorporated town. The red line provides a layout of an 80-acre parcel that West Yellowstone purchased in 2016 from the US Forest Service, in hopes of using the land to further the development interests of the town and the need to accommodate an increasing number of national and international guests (Town of West Yellowstone, 2017). Another useful piece of

information concerning the layout of West Yellowstone, particularly as it relates to the survey effort mentioned later in the thesis, pertains to Highway 20 and its function as a dividing line between “Old Town” and “New Town”, where “Old Town” is roughly everything south of Highway 20 and “New-town” is roughly everything north of Highway 20 (see Figure 3). As the names imply, “Old Town” is the original part of town that features much of today’s business and commercial districts near the park entrance, with older residential housing units scattered within it. “New Town” or the Madison Addition, developed in 1984, serves as the more residential section of town, mainly made up of residentially zoned neighborhoods, second homes, the school, and apartment complexes. Figures 4-6 provide the spatial layout and land use of West Yellowstone. Regarding West Yellowstone, there is no current evidence that suggests there is any difference in the perceptions of individuals based on the part of town they reside in. However, Figures 4-6 will be particularly useful later on when discussing response rates and how they varied throughout different portions of town, especially when comparing “Old Town” and “New Town”.

Figure 7 is one of several official maps of Yellowstone National Park provided to visitors via the Park’s NPS website. The location of West Yellowstone is highlighted with the large oval placed over the western entrance to the Park. The road segment for the hypothetical shuttle system runs from West Yellowstone (the large oval over the western entrance) heading east to Madison Junction, then heading south until reaching Old Faithful. Although the shuttle system and the visitor experience of shuttle users are important, for this study only the general location of the shuttle and its concept are necessary for creating a scenario to assist residents when assessing the shuttle’s perceived impact on their quality of life.

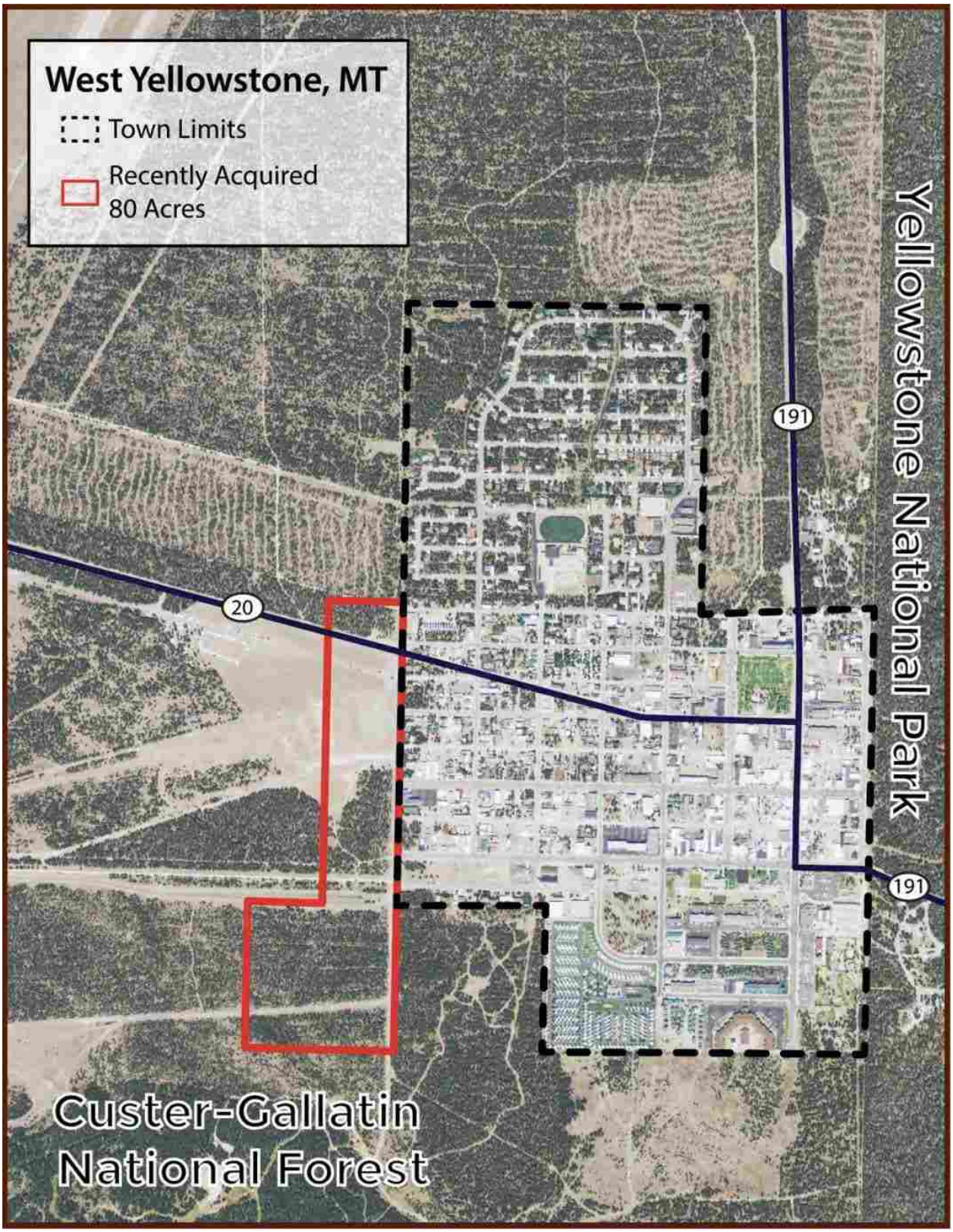


Figure 3: Map of West Yellowstone (Town of West Yellowstone, 2017)

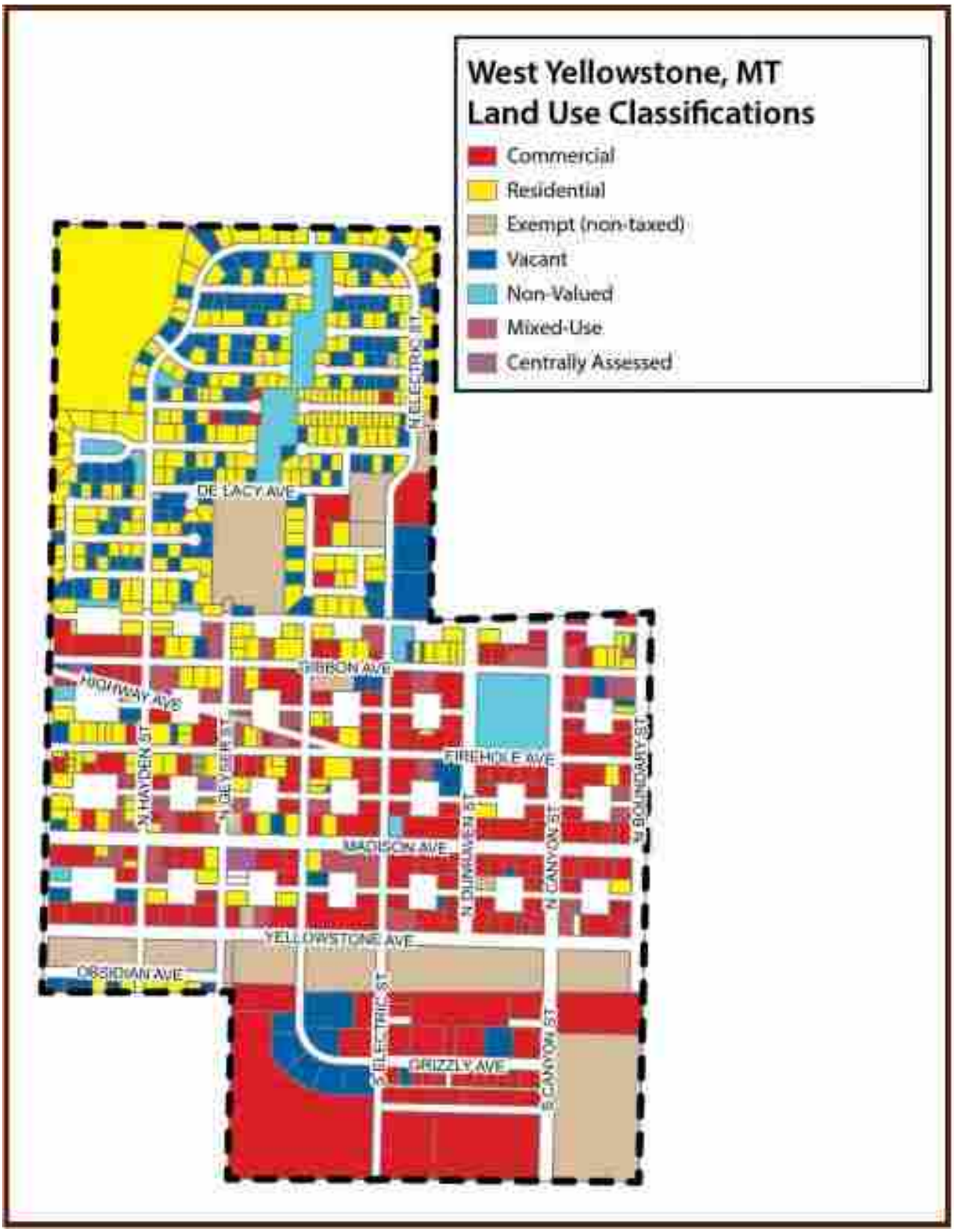


Figure 4: Map of West Yellowstone, MT Land Use Classifications (Town of West Yellowstone, 2017)

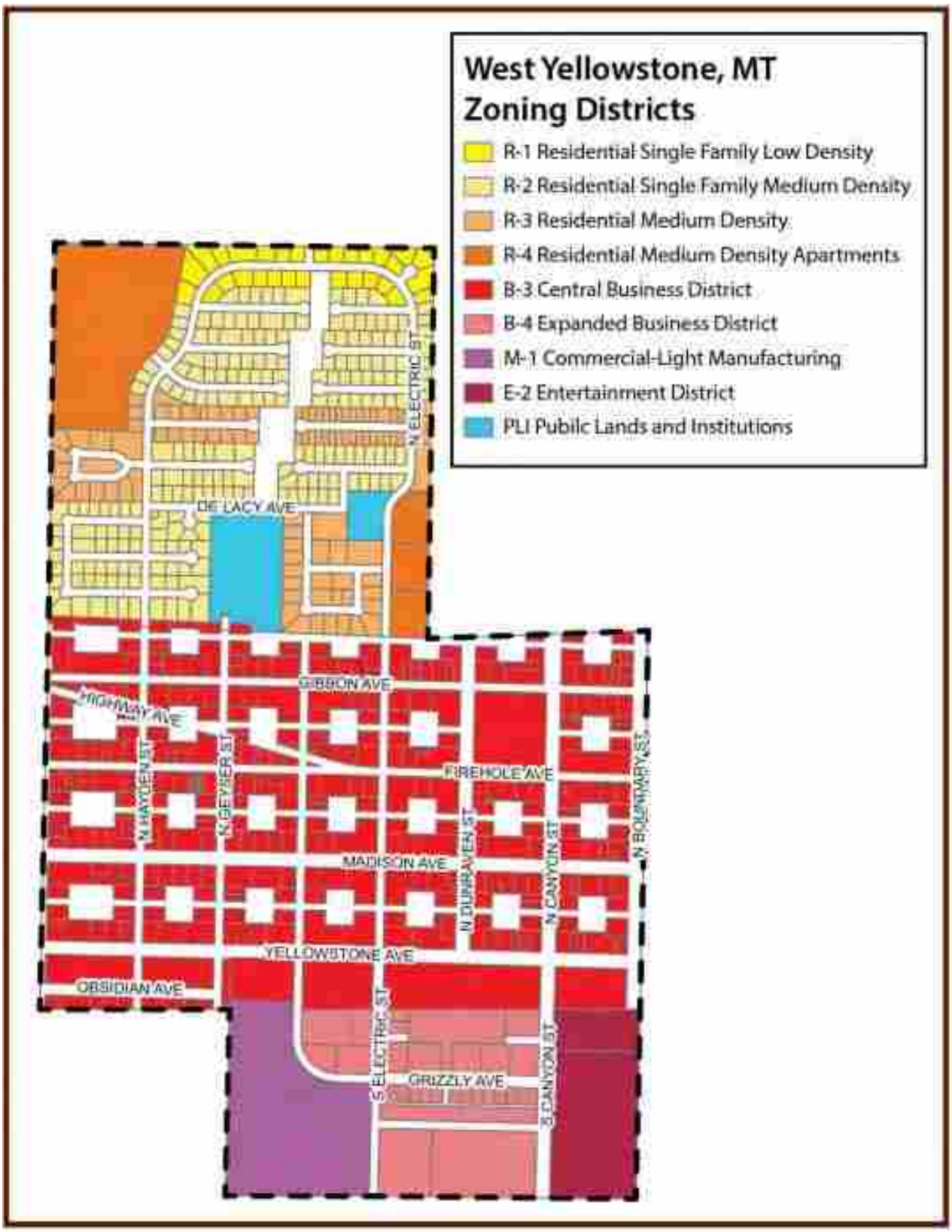


Figure 5: Map of West Yellowstone, MT Zoning Districts (Town of West Yellowstone, 2017)

Figure 6: Map of Areas of West Yellowstone (Town of West Yellowstone, 2017)

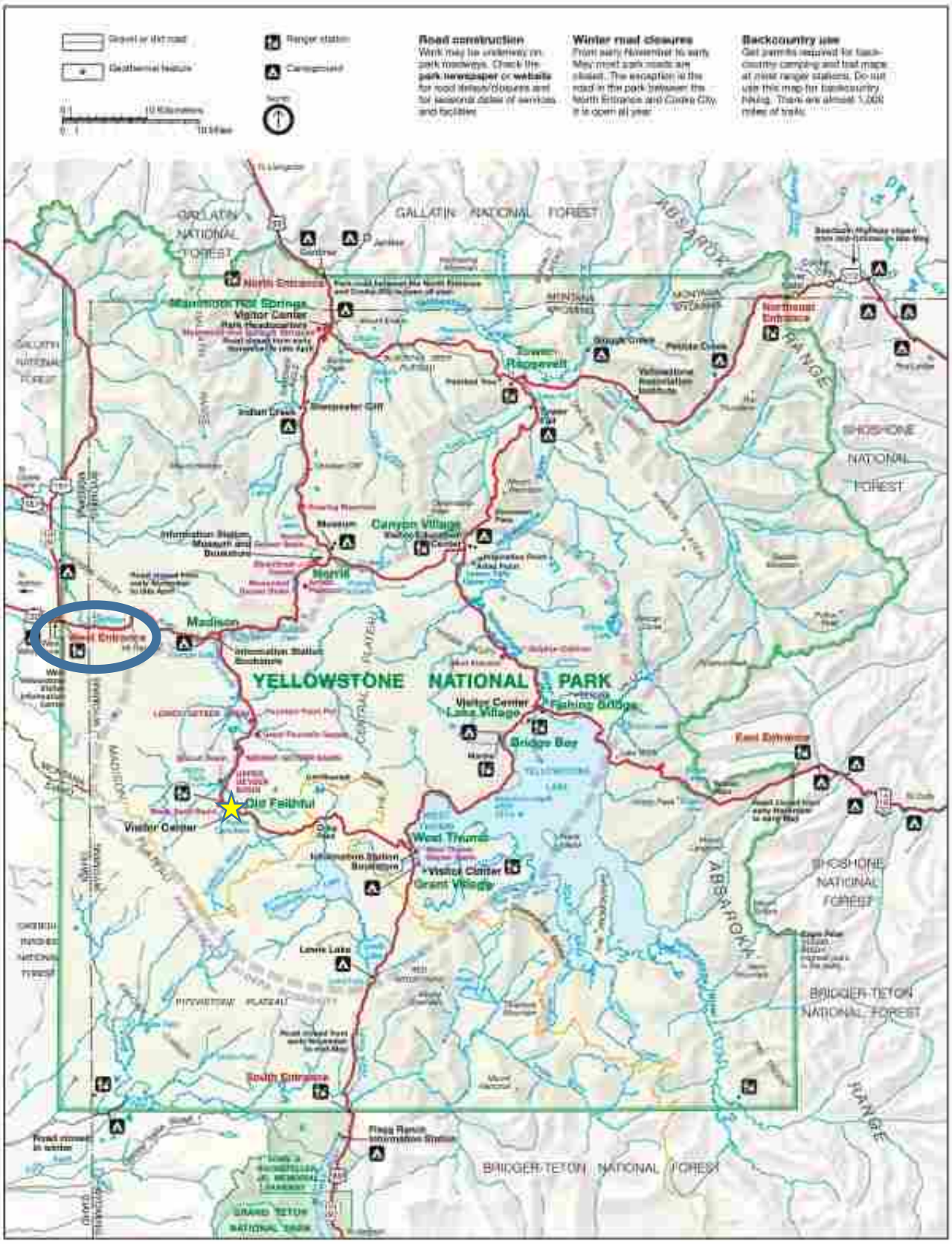


Figure 7: Map of Yellowstone National Park (National Park Service, 2019)

West Yellowstone, with its location immediately adjacent to YNP, and its popularity as a gateway community to the park, provides the unique opportunity to explore alternative transportation systems into the Park. The purpose of this study, therefore, is to examine how a voluntary shuttle system from West Yellowstone to Old Faithful might impact the quality of life for residents of West Yellowstone. To provide context for the next several pages, the literature review will begin by discussing ATS in the NPS and gateway communities, followed by literature as it relates to QOL and how it is measured (particularly in a tourism setting). Lastly, the literature review will focus on the study of attitudes and residents' attitudes towards tourism development within their community.

Literature Review

Alternative Transportation Systems in the National Park Service

Alternative transportation has a long history of operation within National Park Service units (Bryne and Upchurch, 2014; Daigle, 2015; Mace, 2014). As of 2018, 95 transit systems operated in 60 park units in the U.S. (Pildes, et al., 2019). The transit systems, provided through contractual, concession and/or partnership arrangements, provide visitors with an alternative means of experiencing the NPS (Pildes, et al., 2019). However, the name ATS itself assumes something to begin with: that there is a main form of transportation within the national parks that warrants an alternative. In the Federal Lands Transportation Program Fact Sheet, the Department of the Interior gives the following definition for what is considered an ATS:

> "Alternative transportation systems encompass all modes of travel other than the private motor vehicle. Within a park, this can include land- and water- based transportation through utilizing trolleys, buses, water-born vessels, aerial trams, bicycle sharing

systems, and intelligent transportation systems" (U.S. Department of the Interior, 2017, p.2).

The fact sheet continues on to describe some of the ways that ATS can help improve visitor access and the visitor experience, such as: relieving traffic congestion and parking issues associated with capacity visitation, improving air and noise pollution, reducing potential conflicts between wildlife and automobiles, and reducing fossil fuel consumption (U.S. Department of the Interior, 2017).

As the definition articulates, the subject matter of ATS in the NPS is broad in scope and complex to grasp. Issues that plague one park may never show in others, and even when issues are similar, they may manifest themselves in ways that are unique to a specific park. For instance, it's not fair to compare a shuttle system like that found in Zion National Park to something that could be entertained in Yellowstone National Park. Yellowstone National Park operates five gates during peak season, has much less control over the mobility of its visitors once inside the park, and is roughly 15x the size of Zion National Park. Although lessons can be learned from each park as to how to best use ATS in a national park setting, to compare the two parks on an apples-to-apples basis would be impractical. For further comparison, listed below in Table 1 is a display of some of the published research efforts that have examined different shuttle systems currently proposed or in operation in the National Park Service.

Table 1: Case Studies of ATS in National Park Service Units

Park Service Unit	Shuttle Type	Cost	Authors
Zion NP	Mandatory	Free	Mace et al., 2013.
Rocky Mountain NP	Voluntary (Multiple)	Free	Taff et al., 2013.
Yosemite NP	Voluntary (Multiple)	Free	Taff, et al., 2013.
Acadia NP	Voluntary	Free	Holly et al., 2014.
Grand Teton NP	Voluntary (Proposed)	Free	Newton et al., 2018.
Sequoia NP	Voluntary (2)	Free	Wilson et al., 2018.
Colonial National HP	Voluntary (Proposed)	Varied (Proposed)	Shiftan et al., 2006.

Important to keep in mind, though, is that transportation itself should be considered more than just a means for accessing the park; it can be a form of recreation in and of itself (Manning et al., 2014). Many of the beloved and highly visited parks in the US were designed to accommodate travel via car, sometimes even making the roads themselves destinations to be experienced such as: Going-to-the-sun Road in Glacier National Park, Tioga Road in Yosemite National Park, Trail Ridge Road in Rocky Mountain National Park, Paradise Valley Road in Mount Rainier National Park, and Park Loop Road in Acadia National Park (Holly et al., 2014; Mace et al., 2013; Manning et al., 2014). As of 2018, the National Park Service transit modes and use rates are segmented into the following categories: 74% shuttle bus/van/tram, 23% boat/ferry, 2% train/trolley and 1% plane (Pildes, et al., 2019). Furthermore, ATS business models for the NPS are analyzed and segmented accordingly: 53% concession contracts, 19% owned and operated by the NPS, 14% cooperative management, and 14% service contracts/agreements (Pildes, et al., 2019). These ATS served 42.1 million visitors to the NPS,

accommodating 9 million more visitors than in 2012 but 1.6 million fewer than 2017 (Pildes, et al., 2019).

In regard to national parks like Yellowstone, parks that are large in size and feature several access points, transportation and crowding dilemmas have been part of management concerns for decades. As Aubrey Haines prophetically points out in his work on the history of YNP:

> "The philosophy that has guided the development and use of the Park in the past – essentially one of unrestricted visitor use – will hardly do for a future in which the ever mounting pressure of visitor use is unlikely to be matched by funding which will decently accommodate such use presuming the area could stand the strain without deterioration of its park values" (Haines, 1997, p.385).

According to the NPS website, 13,727 recreationists visited YNP for the entire year in 1904. Juxtapose that with 4,257,177 recreation visitors in 2016 during the NPS Centennial (National Park Service, 2020), a park record, and it's easy to see that the transportation dynamics of YNP are complicated. Although Park visitation has leveled off in recent years, it has still eclipsed 4,000,000 visitors annually since 2015 (National Park Service, 2020). The advent of the automobile, the airplane, and now the internet, have challenged YNP to reflect on its management actions and policies within a perpetually modernizing world. As more international visitors frequent the park, along with visitors who experience it "virtually" online through social media or park websites, YNP is an evolving organism. In addition, the ever-present potential of a global pandemic like the 2020 COVID-19 outbreak can not only freeze park visitation, but bring global travel to a halt.

In total, 187,291,938 people have visited Yellowstone since 1904, with half of that visitation (97,593,669) occurring from 1990 to the present (National Park Service, 2020). A forecast for park visitation using prior growth data suggests visitation to the park in the year 2050 would likely reach 5,205,470 visitors with a lower bound estimate of 3,689,385 visitors and an upper bound estimate of 6,721,554 visitors. The 2016 "Find Your Park" advertising campaign shows that the park continues to be used as an effective marketing tool for attracting visitors to the nearby towns. Yellowstone National Park's 150th Anniversary will be taking place in 2022. This may help drive visitation during the year, especially given the stagnant growth in park visitation over the past four years. Therefore, any limitations or alternatives aimed at improving the visitor experience that consequentially reduces or caps the economic potential of the community may not be met with the same enthusiasm from local residents.

YNP itself is no stranger to ATS. As mentioned in the introduction, YNP and West Yellowstone have a long history of accommodating guests' transportation needs other than by personal vehicle (Shea, 2009; Whittlesey and Watry, 2008; Yellowstone Historic Center, 2019b). Still today, ATS are frequently used within the park, encompassing a wide range of interpretive touring transportation options. In 2018, YNP observed 20,624 passenger boardings by boat/ferry, 16,133 passenger boardings on interpretive bus tours, 12,065 passenger boardings on historic bus tours, 13,994 passenger boardings on interpretive snowcoach tours, and 28,319 boardings through Yellowstone Snow Coach Contracts (Pildes, et al., 2019, p.33).

However, the ATS in YNP that has arguably proved the most controversial in its management has been the snowmobile (snowmachine). Briefly discussed in the introduction was the significant decrease in the number of snowmobiles that entered through West Yellowstone from the years 2002 (42,071 snowmobiles) to 2004 (12,421 snowmobiles) (National Park

Service, 2020). This 70 percent reduction was due to the Park's decisions to manage bison herd conflicts that arose out of increased winter visitation.

Prior to that decision, researchers employed both quantitative and qualitative methods to develop a generalizable understanding of what experiences visitors seek in YNP and to what extent they support management actions, as well as why visitors feel as they do about management interventions (Borrie et al., 2002). Results from the quantitative research found that, based on a 5-point Likert scale from 1 = very unimportant to 5 = very important, the most reported preferred experiences within YNP were 'enjoying natural scenery' (4.77), 'view wildlife' (4.63), 'have fun' (4.37), and 'view bison in natural settings' (4.22) (Borrie et al., 2002, p.55). Similarly, on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree, researchers found that, "respondents across the board, including visitors on skis, snowcoach, and snowmobile, expressed general lack of support of any of these management actions" to protect bison herds (Borrie et al., 2002, p.56). Only one management action aimed at protecting bison herds elicited a neutral mean, which was to 'limit the size of groups' (3.01). The other eight management actions and their means ranged from 2.88 in regard to 'being able to travel only in specific areas', to a mean of 1.95 for the 'action to require visitors to obtain a randomly distributed, but limited in number, permit' (Borrie et al., 2002.)

Results from the qualitative portion of the research interviews conducted with visitors, showed four distinct themes: access as a role of YNP, lack of a credible problem, impacts on visitor experience, and the concern over whether or not recommendations were based on science or opinion (Borrie et al., 2002). Furthermore, the qualitative data showed a recurring challenge in the perceived credibility of decision makers, with some visitors suggesting that politics may play a role in management initiatives (Borrie et al., 2002).

Guidelines to improve transportation systems in NPS units were put in motion by President Bill Clinton in conjunction with the US Department of the Interior in 1996. These guidelines include, "the preservation and protection of natural resources, improving accessibility and the overall visitor experience, and promoting energy efficient transportation systems that moves visitors safely through the park" (Mace, et al., 2013, p.1273). As other researchers have observed, the creation of guidelines or standards allows for baseline data and continuous monitoring to take place, designed to help park managers assess whether their management plans are functioning properly (Daigle, 2008; Mace, 2013). Researchers have determined several indicators of the ATS experience such as freedom of use, efficiency, accessibility, crowding, convenience, transportation perceived as an attraction, environmental values, cost, stated preference, and availability of accurate real-time information (Mace, 2013, p.1272). In addition, perceptions of an ATS depend on whether or not the shuttle is mandatory and whether or not there is a fare.

So far in this review, ATS have been presented almost exclusively from the perspective of national park visitors and their desired experience(s). As is often the case, most research efforts conducted on the subject have been concerned with the visitor experience while using a shuttle. Although this information presented is necessary to develop a complete understanding of the role of ATS in the visitors' experience, there is a research gap in the relationship of the ATS and the local residents of the gateway communities.

Effects of ATS on Gateway Communities

Gateway communities are defined as the towns and cities that border public lands and national forest areas (Howe, McMahon, and Propst, 1997, p.1). Expanding on that definition the NPS defines a gateway community as all counties contained within a 60-mile radius around each

park boundary. Spending that occurs within these parameters is used as the economic measure attributed to that particular park (National Park Service, 2018). Based on this definition, West Yellowstone, MT is a gateway community. These gateway communities, generally known for their scenic beauty, offer high quality of life to their residents (Dunning, 2015; Howe et al., 1997). Many gateway communities are largely dependent on tourism as the major contributor to the local economy. This dependence on tourism many times emerged out of a transitional process of moving from a resource extraction economy to a tourist attraction economy (Dunning, 2015). Even when a community accepts the role tourism plays in its economy and everyday life, challenges can arise out of the distribution of the economic success created by the tourism industry (Dunning, 2015; Nickerson et al., 2018).

A significant portion of the literature on ATS focuses on understanding and managing NPS units to improve the visitor experience. However, research often does not consider the adjacent gateway community, another important stakeholder. As noted by Mace et al. (2013), important questions arise from different segments of the community; for instance, how might this shuttle impact my business or how will this shuttle impact the perception of our community and its image (Mace et al., 2013, p.1284)? Following implementation of the shuttle system in Zion National Park, an economic assessment of the shuttle systems in the gateway community of Springdale, Utah, focused on three questions: how are local business owners affected by a shuttle system, how does this segment (that depends on the money of tourists) perceive the shuttle system, and do businesses benefit from the implementation of a shuttle system? (Marquit and Mace, 2015). Of the 59 business owners and employees surveyed, 87 percent stated that the shuttle system is not cause of concern to their business (Marquit and Mace, 2015). Overall, the majority of business owners felt the shuttle system had a positive impact on their businesses, the

park experience, and the community (Marquit and Mace, 2015). Furthermore, they feel the shuttle is efficient, accessible, successful, and positively impacts the scenic beauty and naturalness of the park (Marquit and Mace, 2015).

When discussing transportation in NPS units, it's important to remember transportation issues, such as crowding and congestion, are not contained entirely within the park, as transportation issues fundamentally transcend the boundaries between protected areas and gateway communities (Daigle, 2008; Dunning, 2015). To implement a successful ATS, there must be a collaborative partnership between stakeholder groups to ensure that all parties have the opportunity to express hopes and concerns. Some of the stakeholder groups to be involved in the discussion include: administration of protected land (superintendent, concessioner liaisons), the local population (mayors, elected officials), transportation providers, business community (chambers of commerce, tourism agencies, etc.), local economic development, and non-profit organizations (Dunning, 2015). A consensus of support from the gateway community can help contribute to joint financing schemes, land use policies that are supportive of transportation initiatives, and strategies for disseminating information to the greater public (Dunning, 2015).

With respect to the effects ATS may have on a gateway community, particularly in a place like YNP that is at least 80 miles from any airport of appreciable size, one of the initial major hurdles to consider in planning ATS is how to eliminate the need for visitors to rent a private vehicle to reach the area (Dunning, 2015). Even if these steps cannot be mitigated on a larger transportation scale (i.e. direct shuttle/train service to YNP from airport), gateway communities are usually intimately involved with the establishment and maintenance of the ATS (Marquit and Mace, 2015). As the face of the community, residents are usually a first contact point for information once guests arrive to the area and begin settling in to their accommodations

(Dunning, 2015). Hence, to generate community support for the ATS, proponents of transportation systems should design opportunities and means to attract the locals to use the system even if only on a trial basis. Unfortunately, it is common that gateway communities are unfamiliar with their own transportation systems (Dunning, 2015).

Work conducted in England's largest national park, Lake District National Park, looked at understanding how to improve residents' quality of life using indicators such as air quality, visual and noise impact, as well as the broader issue of carbon emissions that place an environmental burden on the park (Stanford, 2015). Lake District National Park is a highly visited park and generates significant income for the local area of Cumbria. Given the significance of the park and its ecological health in relation to the economic benefits it provides to the region, researchers found it troubling that roughly 85 percent of visitors to the park used a private vehicle when touring. For residents, their quality of life could enormously benefit from a reduction in the visual and aural pollution associated with traffic congestion (Stanford, 2015). However, as noted, many of these indicators can be reduced or addressed only if visitors are willing to participate in the shuttle system as well.

Quality of Life

The implementation of ATS could possibly improve the quality of life of the residents who live in the gateway community. Quality of life (QOL) is a construct that has produced much debate in the literature. Researchers have argued that QOL has two dimensions: an objective dimension that is external to the individual and subjective dimension that reflects individual feelings and perceptions (Andereck and Jurowski, 2006). Some researchers like Renwick and Brown (1996) proposed that QOL refers to how good one's life is as an individual. Other researchers, such as Bryan Massam (2002) pointed out that, "QOL means different things to

different people and embraces well-being and satisfaction which focuses on the individual" (p.148). One of the more detailed definitions of QOL comes from Szalai and Andrews (1980) who argue the following points:

> "1) it refers to human life only; 2) it is rarely if ever used in the plural; 3) it is used as a single indivisible generic term whose meaning can be clarified; and 4) it is difficult to classify into any discrete category of related social sciences" (Szalai and Andrews, 1980, p.8).

Romney, Brown, and Fry (1994) have argued that QOL is not considered a universal value due to variations in cultural factors while other researchers have argued that QOL is to be considered a universal value (Andereck and Nyaupane, 2011). Regardless, it is generally accepted that QOL is a measure and term that refers to individuals and their evaluations of how certain characteristics of their environment lead to positive or negative assessments of their own lives. Researchers like Robert Schalock (2000) have made

Quality of Life Indicators		
Dimension	**Exemplary indicators**	
Emotional well-being	Safety	Freedom from stress
	Spirituality	Self-concept
	Happiness	Contentment
Interpersonal relations	Intimacy	Interactions
	Affection	Friendships
	Family	Supports
Material well-being	Ownership	Employment
	Financial	Possessions
	Security	Socioeconomic status
	Food	Shelter
Personal development	Education	Personal competence
	Skills	Purposeful activity
	Fulfillment	Advancement
Physical well-being	Health	Health care
	Nutrition	Health insurance
	Recreation	Leisure
	Mobility	Activities of daily living
Self-determination	Autonomy	Personal control
	Choices	Self-direction
	Decisions	Personal goals/values
Social inclusion	Acceptance	Community activities
	Status	Roles
	Supports	Volunteer activities
	Work environment	Residential environment
Rights	Privacy	Due process
	Voting	Ownership
	Access	Civic responsibilities

Table 2: Quality of Life Indicators (Schalock, 2000, p.122)

repeated efforts throughout their careers to synthesize the dimensions and indicators for understanding and measuring QOL. A revised version of Schalock's (2000) work in Table 2 demonstrates how indicators relate to their respective domains.

In a gateway community, residents' associations between QOL and tourists are influenced by both internal factors (i.e. related to the residents' personal characteristics and those of the tourists) and external factors (i.e. the perceived impacts of tourism and community development) (Carmichael, 2006). Researchers have explored some of the common factors that influence quality of life for residents as well as the quality of the tourism experience for visitors. Below in Figure 8 is a summation of these common factors.

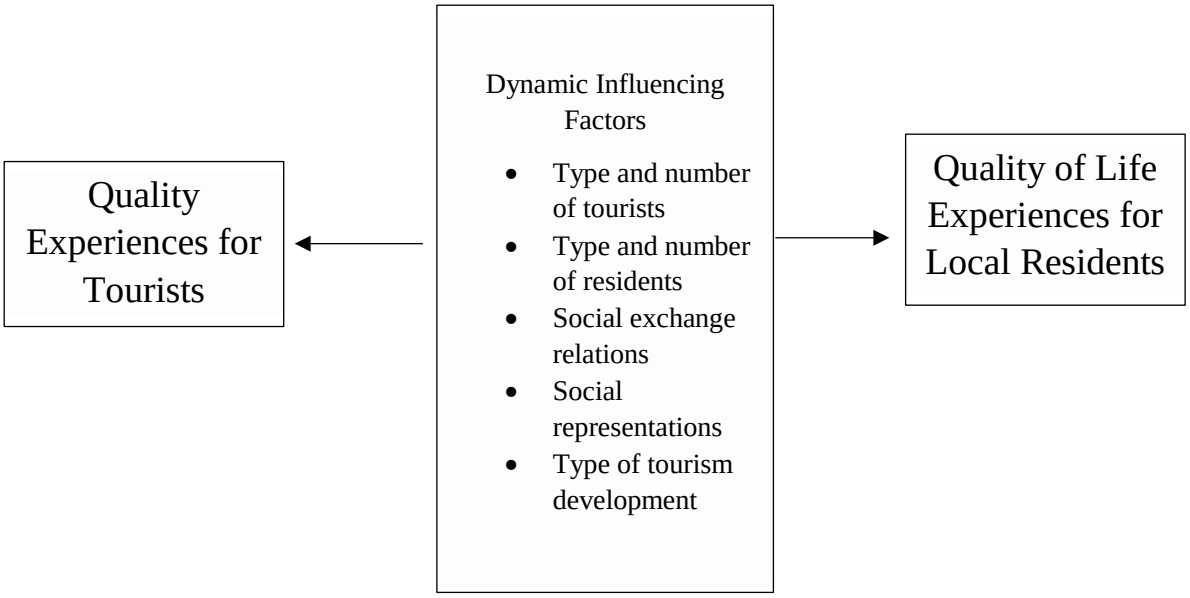


Figure 8: Factors Influencing Quality of Life for Residents and Quality Experiences of Tourists with a Tourism Context Source: (Carmichael, 2006, p.130)

A common way that QOL is measured in the tourism literature is through the use of an Importance-Performance Analysis (IPA). IPA was introduced in 1977 by Martilla and James as way to measure satisfaction with a particular consumer product or service (Frauman & Banks, 2011). The IPA approach focuses on measuring satisfaction in two ways: by understanding how important a product or service is to an individual along with how satisfied the individual is with

the current performance of the product or service (Martilla & James, 1977). Typically, mean values for the importance satisfaction are placed on the X axis and mean values for the performance satisfaction are placed on the Y axis, with a subjective intersection used to create four quadrants. These four quadrants help researchers identify characteristics that are not as important and in adequate condition, characteristics that are important and in adequate current condition, characteristics that are not as important and in unacceptable condition, and characteristics that are important and in unacceptable condition (Frauman & Banks, 2011). Other research efforts have also combined ratings for these two scores to then produce an overall picture of satisfaction with the product, service, or characteristic of their community (Andereck & Nyaupane, 2011; Brown at al., 1996; Frauman & Banks, 2011).

QOL models allow researchers to identify which characteristics of tourism contribute positively to QOL, such as outdoor recreation opportunities, restaurants, and natural and cultural attractions, as well as which characteristics contribute negatively, such as crowding, traffic and parking problems, increased cost of living, and a general dependence upon low-wage, seasonal labor (Allen et al., 1993; Andereck & Nyaupane, 2011; McCool & Martin, 1994; Tooman, 1997). Research on QOL in gateway communities has shown that several indicators and domains can be associated with QOL and satisfaction related to perceived community well-being. Some of these indicators of Tourism Quality of Life (TQOL) Domains include urban issues, way of life, community pride and awareness, natural and cultural preservation, economic strength, recreation amenities, and crime and substance abuse (Andereck and Jurowski, 2006; Nickerson et al., 2018). In a study of Gardiner, Montana residents, indicators like clean air and water, preservation of wildlife habitat, and access to recreation opportunities all scored highly. Gardiner, Montana is the original gateway community to YNP. Understanding the indicators that

are reflected within a specific gateway community are important to comprehending residents' perceived QOL. One of the major indicators and predictors of understanding support for tourism development (in this case ATS) deals with a particular mental state or evaluation towards an object, otherwise known as an attitude.

Attitudes

At its essence, an attitude refers to a mental state or psychological evaluation held toward a particular object that is generally measured by researchers using scale items that incorporate a range of positive to negative evaluations of that object (Azjen & Fishbein, 1980; Azjen, 2001; Vaske & Donnelly, 1999). Attitudes tend to be strongly held by individuals, and as a result are often stable over a long period, are difficult to change, and have been known to predict observable behavior (Azjen, 2001; Azjen & Fishbein, 1980). Attitudes have long held an important place in the tourism literature. The ability to understand these phenomena has significant implications for park and resource managers, business owners, community residents, and park visitors; all of whom depend in some way on understanding the attitudes held by all parties involved in decision-making efforts.

In a broader sense, an attitude is one component of a more encompassing model of human behavior found in the social psychology literature known as the cognitive hierarchy, which describes an attitude as a function of multiple subjective, yet salient beliefs about an object (Azjen & Fishbein, 1980; Vaske & Donnelly, 1999). Other research efforts have defined an attitude as, "an enduring predisposition toward a particular aspect of one's environment" (Carmichael, 2006, p.118). According to Carmichael (2006), attitudes are structured into three dimensions: (1) cognitive (beliefs, knowledge, perceptions); (2) affective (likes and dislikes);

and (3) behavioral (action taken or expressed, instinct to act with respect to a particular object or place) (p.118).

Many research efforts that analyze QOL closely resemble attitude studies. The distinction between QOL and attitude studies, however, is distinguished by measurement. Most research on attitudes towards tourism are concerned with general attitudes towards characteristics of the resident's community, whereas QOL research is concerned with perceptions of an individual's satisfaction with specific domains (Andereck & Nyaupane, 2011).

To complicate matters further, individuals are capable of holding multiple attitudes towards one particular object, where the overall attitude the individual possesses is a sum total of all the individual's opinions or perceptions towards that object. In this sense, "object" can refer to an event, institution, person, or more generally, any aspect of the individual's world (Azjen & Fishbein, 1980). By measuring either the strength or ambivalence of the salient beliefs, researchers can understand the association between the salience of beliefs and the predictability of attitudes to change behavioral intentions and behavior. Theories like the Theory of Planned Behavior or the Theory of Reasoned Action have long served as helpful models for not only gaining information on the determinants of a particular attitude but also the degree to which an attitude can be predicted (Azjen, 2001; Azjen & Fishbein, 1980). Due to their close relationship with beliefs, attitudes serve an important function in developing a sense of identity through direct experience that informs one's intention to act (Heberlein, 2012).

Attitudes towards Tourism and Tourism Development

Attitudes are generally stable over time and are resistant to change, although still susceptible to change on a temporal scale (Azjen, 2001; Azjen & Fishbein, 1980). However, this does not mean that attitudes will never change. For disciplines like tourism and recreation

research, this long-term ebb and flow nature of attitudes has been captured by research efforts over the decades. As Andereck and Vogt (2000) point out, research on attitudes in the tourism literature has gone through several phases; initially, research efforts of the 1960s were focused on the positive impacts of tourism, followed by a negative impact focus in the 1970s, followed by a more systematic approach used in the 1980s (Andereck & Vogt, 2000). Regardless of the era, the field has traditionally measured attitudes with the use of Likert scales with respect to specific aspects of tourism such as agreement scales, support scales, and Importance-Performance scales.

These data can then be reduced into multiple correlations using such techniques as a factor analysis (Andereck & Nyaupane, 2011; Andereck et al., 2005; Andereck & Vogt, 2000; Lankford, 1994; McCool & Martin, 1994). Research has shown that characteristics within a tourism dependent community can be reduced to three or four dimensions, generally revolving around economic, social, cultural, and environmental factors with an emphasis on the importance of the latter (Andereck & Nyaupane, 2011; Frauman & Banks, 2011; Kim et al., 2013). Other researchers have attempted to show causal links between attitudes towards tourism and support for tourism development through multiple regression analysis, finding that residents must feel their concerns are being heard in addition to providing them access to the planning and review process (Lankford & Howard, 1994). In addition, tools like structural equation modeling (Gursoy et al., 2002; Pham et al., 2019), and Importance-Performance Analysis (Andereck & Nyaupane, 2011; Frauman & Banks, 2011; Martilla & James, 1977) have been used and are proven to be adequate techniques for studying QOL.

Rural Attitudes towards Tourism and Tourism Development: Gateway Communities

As the population of rural areas in the US have declined in recent decades, there has been a concentrated effort to assist ailing communities through different economic strategies, one of which is tourism. When attempting to understand the impact this shift may have, most research efforts have focused on the perceived positive or negative impact tourism provides, generally attempting to understand the specific benefits it provides to a community (Perdue, Long, & Allen, 1990). Understanding the fundamental perception of individual attitudes towards tourism can help resource managers and local government officials predict what strategies will be received positively within their community. Initial research efforts found that, when controlling for personal benefits of tourism, perceptions of tourism impacts had no relation to sociodemographic characteristics. Instead, support for further development was dependent on whether individuals perceived tourism was positively impacting their lives (Perdue, et al. 1990). Additional research has shown that certain groups, such as business owners, hold more positive attitudes towards tourism than those who were simply employees or unaffiliated with the tourism industry (Andereck & Vogt, 2000). In addition, dependence on or employment within the tourism industry is the only consistent predictor of tourism attitudes (Andereck & Nyaupane, 2011; Lankford & Howard, 1994). Related research efforts that have attempted to show the predictive nature of attitudes towards tourism have focused on residents' contact with tourists, their community attachment (i.e. how long they have lived in that community), and their knowledge of the tourism industry, albeit with inconclusive results (Andereck & Nyaupane, 2011; Gursoy, et al., 2002; Lankford & Howard, 1994; McCool & Martin, 1994).

National parks have long served the role of operating as economic engines to their adjacent communities. However, unlike other common tourist destinations, national parks and their neighboring gateway communities are typically located in more rural settings that do not offer the routine environmental, social, or economic amenities of an everyday large city. These generally rural areas, much like the individuals that call them home, are a collection of dynamic experiences, identities, and values that allow a place to embody a certain soul.

One theoretical framework often used to assess residents' attitudes towards tourism, particularly rural residents' attitudes, is known as social exchange theory. Social exchange theory focuses on understanding the exchange of resources individuals are willing to make within a group context based on the reward or benefit that is presented to the individual as a result of performing an exchange of a resource at a group level (Andereck & Vogt, 2005; Perdue, Long, & Allen, 1987; Wang & Pfister, 2008). For rural communities that are undergoing an economic transition, social exchange theory can be a particularly useful to highlight the cognitive processes individuals undergo as they weigh individual costs and benefits in light of alternative development options in their community. Although this framework is helpful, it does not serve as a blanket application to assess all kinds of tourism development options.

Despite extensive research on attitudes towards tourism, the intersection of attitudes towards tourism and alternative transportation systems, explicitly as it pertains to residents' attitudes, is relatively sparse. As Anne Dunning (2015) points out, transportation issues that occur in national parks fundamentally transcend any artificial park boundary and require collaborative partnerships between local stakeholders in order to reach any meaningful action. One of the most important aspects towards predicting how successful an alternative transportation system will be is determined by the beliefs and attitudes locals hold about the

system itself (Dunning, 2015). If residents, often through direct experience with their own shuttle system or another shuttle system, develop a negative attitude towards that system, the likelihood they will recommend it to visitors is slim.

Residents' Quality of Life in Gateway Communities

When beginning to understand the residents' attitudes and perceptions towards QOL, it is important to remember that the visitor cannot be separated from the residents' experience, as these moments of interaction are not occurring within a vacuum (Carmichael, 2006). Local residents within the gateway communities influence the quality of the visitor's experience, and consequently affect the visitor's QOL as well (Carmichael, 2006). Generally, residents who are supportive of tourism tend to be more receptive and friendlier to visitors, which creates a positive experience for the visitor. However, what is considered a quality experience for the visitor might not translate into a quality experience for the residents of that community, as myriad factors influence resident attitudes towards tourism and how tourism affects quality of life (Carmichael, 2006).

Commonly explored in the QOL literature is the idea of economic benefits and economic metrics to assess the QOL. However, this assessment does not capture the entire picture of QOL. For example, economic indicators such as tourist income, or GDP might express increased economic value in the region but fail to address how this success is distributed within the community (Andereck and Jurowski, 2006). As Andereck and Jurowski (2006) point out, "although the prevailing belief is that educating residents about the economic benefits of tourism will increase support within the community for tourism development, it is clear that there are other community quality-of-life attributes that may be even more important to local residents" (p.151).

To create a more holistic understanding of how tourism may affect residents, and subsequently their QOL, research should focus on three categories: (1) economic, such as tax burdens, inflation, and job availability; (2) sociocultural, such as community image, the availability of festivals and museums, and awareness of cultural heritage; and (3) environmental, such as crowding, air, water, and noise pollution, wildlife destruction, and litter (Andereck and Jurowski, 2006). Harkening back to the previously mentioned research conducted in Gardiner, MT (Nickerson et al., 2018) in relation to residents' perceived quality of life, Andereck and Jurowski's framework helped guide the research. These domains, in conjunction with regression analysis, have proven to be effective in capturing the economic, sociocultural, and environmental categories that encompass QOL in a gateway community.

Using West Yellowstone as a case study, this research aimed to address the gap in understanding residents' current perceptions of the community's quality of life (QOL), but more precisely, understanding how a hypothetically proposed form of tourism development (a voluntary shuttle system) could impact perceptions of QOL.

Methods

Research Design

The research questions used to guide this study are as follows: 1) How do residents of West Yellowstone, MT currently perceive their quality of life? 2) How does the hypothetical implementation of a voluntary shuttle system originating in West Yellowstone affect residents' perceptions of their quality of life? 3) To what degree does the residents' relationship to the tourism industry predict their perceptions of how a shuttle would impact their future QOL? This

study used a quantitative survey, closely following the Andereck and Jurowski (2006), further refined by Andereck and Nyaupane (2011), QOL studies.

The characteristics and indicators presented in this study include the following: (1) A five-point Likert scale where 1 = not at all important to 5 = extremely important, asking residents to rate how important 24 quality of life characteristics were to them personally; (2) A five-point Likert scale where 1 = not at all satisfied to 5 = extremely satisfied, asking residents to report how satisfied they are with the performance of those same 24 quality of life characteristics; (3) A five-point Likert scale ranging from -2 to +2, where -2 = negatively impacted, 2 = positively impacted, with 0 (mid-point) = no impact, asking residents to rate how the implementation of a voluntary shuttle system might impact the same 24 quality of life characteristics in West Yellowstone; (4) A five-point Likert scale in regard to eight questions related to residents' attitudes towards ATS (particularly developments that would happen within the given scenario of the voluntary shuttle system within the Western Road Corridor) ranging from 1 = strongly disagree to 5 = strongly agree; (5) Five separate 5-point Likert scale items addressing residents knowledge of the tourism industry, role it plays in community/economy, how involved they feel in tourism decision making, the amount of contact they have with tourists, and how they feel they personally benefit from tourism; (6) demographic information including residency type (i.e. permanent vs. seasonal), age, gender, occupation, and family characteristics to gain a better understanding of how these independent variables mesh with the dependent QOL characteristics; (7) an open-ended comment section allowing residents to address any hopes or concerns they feel were not adequately covered in the survey. Residents were only given general information on the corridor in which the proposed shuttle would operate, including that the shuttle would be voluntary in nature and would originate within the town of West Yellowstone.

Sampling Population and Data Collection

This study used door-to-door survey collection with drop-off and pick-up. This method provides better sample sizes than traditional mail-back and telephone surveys when conducting research in small communities (Andereck & Vogt, 2000). As an incorporated town, West Yellowstone has specific boundaries which are shown in Map 1. A map provided by a local real-estate broker supplied the best-known demarcations of residential and commercial property in West Yellowstone. Consultations with the Chamber of Commerce Director in West Yellowstone, and a real-estate broker in the town, determined that the homes to be surveyed would consist of known residences within the town dimensions outlined in Map 1. The separation of "Old-town" and "New-town" or the "Madison Addition" means that residential properties north of Highway 20 are more easily defined and recognizable than their counterparts south of Highway 20. In addition, Figure 3, 4, 5, and 6 presented in the introduction provide some information as to location of potential residential housing units.

Before survey distribution, the West Yellowstone Chamber of Commerce placed posts on both the town's Facebook page and in the Chamber newsletter to provided information to raise awareness of the survey to residents. In August of 2019, the researcher knocked on the doors of housing units in town, explained the project to the resident(s) if they were home, provided as many surveys to the resident as there were the number of adults 18 and over in the household, then returned to pick up the completed surveys the next morning. This process allowed the residents enough time to adequately answer the survey. If no one answered the door, the researcher would hang two copies of the survey with an explanation of the study in a plastic bag from the doorknob along with a request for the resident(s) to complete it then hang it back on their doorknob for later pick-up by the researcher.

Response Rate

The U.S. Census Bureau (2010) estimates there are 910 residential housing units in West Yellowstone. This study relied on a convenience sample of those housing units. For this specific research effort, the researcher distributed surveys to 350 individual housing units within the incorporated town boundary of West Yellowstone. Of those 350 housing units, 106 households responded to the survey producing 160 total surveys. One hundred and seventy-six households removed the survey from their door handle but did not replace it for pick up the following day or were not present at the residence when the researcher returned the following days to retrieve the surveys. In addition, surveys from 68 households were not removed from the original drop off location. When leaving a survey packet for each household, two copies of the survey were left in the event that there were two adults present in the household. The 106 households represent a response rate of 30%.

One observation of note has to do with the difference in response rates across different parts the town. Referring back to Figures 4-6, the 'Madison Addition' in town produced higher response rates (38%) than 'Old Town' (17%). 'Old Town' features more employee housing options and it is possible some people chose not to respond due to their seasonal status as a resident.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) along with Microsoft Excel, and R. First, descriptive and summary statistics were analyzed such as mean, frequency, and standard deviation for all scale items. Second, a factor analysis was conducted to assist in data reduction and to help understand correlations between specific

characteristics of perceived change in QOL (e.g., environmental, social, economic). Third, a stepwise backward linear regression analysis was used to understand the degree to which residents' relationship with the tourism industry affected their perceptions of the shuttle's impact to their QOL. The independent or explanatory variables are the previously mentioned predictor variables (i.e. familiarity with tourism industry, employment status, etc.), while the perceived change in the 24 QOL characteristics consist of the dependent or response variables. Finally, an 'importance'-'performance' score was measured for current QOL, along with reported scores for projected QOL as a result of the shuttle's implementation. The QOL table functions as a summary visual to highlight where West Yellowstone should be concerned regarding a possible implementation of a shuttle system. This provides data on the perceived future of their quality of life in addition to the current performance of those same characteristics. Additionally, a Tourism Quality of Life (TQOL) impact score was created, using a template provided by Andereck and Nyaupane (2011). The score consists of multiple parts: (1) an importance mean was calculated for each QOL characteristic to serve as a baseline for understanding how important each variable was to the community; (2) a satisfaction mean was calculated for each QOL characteristic; (3) a QOL score was then calculated by manually placing

Figure 9: Calculation of QOL Scores Using Importance and Satisfaction

Importance	Satisfaction	Brown, Raphael, and Renwick's QOL	New Quality of Life Score
5	5	+10	20
	4	+5	15
	3	0	10
	2	−5	5
	1	−10	1
4	5	+8	18
	4	+4	14
	3	0	10
	2	−4	6
	1	−8	2
3	5	+6	16
	4	+3	13
	3	0	10
	2	−3	7
	1	−6	4
2	5	+4	14
	4	+2	12
	3	0	10
	2	−2	8
	1	−4	6
1	5	+2	12
	4	+1	11
	3	0	10
	2	−1	9
	1	−2	8

a. Adapted from Brown, Raphael, and Renwick 1998, p. 16.

each variable into its associated category based on its initial importance and proceeding satisfaction (e.g., a 5 on importance and 5 on satisfaction would yield a QOL score of 20, a 5 on importance and a 4 on satisfaction would yield a QOL score of 15, and so on); (4) once the QOL score is calculated, the mean scores for positive or negative (-2, -1, 0, +1, +2) perceptions from residents in regard to those previously mentioned QOL characteristics were used as multipliers to create a product of the shuttle's effect in conjunction with current QOL, creating a perceived impact score that shows the relationship between the importance, performance, and perceived impact on each of the 24 QOL characteristics as they relate to the proposed implementation of the shuttle system.

Limitations

The following limitations to this study include:

1. Residents occupying households only within the official town boundary were targeted for potential surveying efforts. As a rural community in Montana, many residents who work, own businesses, or shop in the town of West Yellowstone do not officially live within its town boundaries (e.g., Horse Butte Road). Results from this study are more reflective of residents who live within the town boundary, not of all residents who call the West Yellowstone area home.
2. Not all residents given a survey completed or returned the survey. In some instances, it appeared the resident never saw the survey because no one was home during the surveying effort period.
3. Several residents refused the survey due to a language barrier or unfamiliarity with English.
4. The scope of this study dealt specifically with the potential impacts a shuttle system may have during the summer or peak season. Assessments of impacts during the winter are not included nor relevant to this study.
5. A specific shuttle scenario (i.e., terminal or parking lot locations, number of stops, time of day, number of buses, etc.) was not provided.

Results

Results from this study are presented in the following order: (1) frequencies, means, and standard deviations for demographic information of respondents; 2) Means and standard deviations for QOL characteristics along with mean, standard deviation, and median values for overall shuttle effect contributing to the new Projected QOL (PQOL) scores; 3) frequencies, means, proportions, and standard deviations for each of the questions related to attitudes towards tourism in addition to the five self-reported questions dealing with residents' relationship with tourism in their community; 4) an exploratory factor analysis for perceived change in QOL factors resulting in three factors with items that load reasonably well and have acceptable reliability; 5) regression analysis on the three factors illustrating residents' relationship to the tourism industry and how that impacts their perception of how the shuttle would influence their future QOL; 6) brief summation of residents' open-ended responses provided. All open-ended responses were organized by theme and any comments used in that section are presented verbatim for readers to understand the depth of suggestion, concern, and satisfaction residents of West Yellowstone expressed.

Demographics

Residents of West Yellowstone who responded to the survey ranged from 20-90 years of age, with a mean age of 57.82 years (s.d = 16.05 years). Gender of the respondents was almost evenly split with females representing 50%, males representing 48%, and 1% preferring not to answer. Residents of West Yellowstone have been there for some time, with the average length of residency being 17.91 years (s.d. = 14.81 years). Additionally, respondents indicated that they spend on average 9.96 months (s.d. = 3.20 months) out of the year in West Yellowstone. Only 14.8% of respondents (n=23) stated that they currently had children in the West Yellowstone school system. Of that group, roughly 50% (n=11) had only one child currently in the school system.

As for employment status, retirees represented the largest response category with 41% (n=65), followed by general employees with 35% (n=55), then business owners with 14% (n=22). Unsurprisingly, the highest reported occupation in West Yellowstone was within the accommodations business with 14% (n=22) of residents selecting that occupation. The retail industry was the next highest reported occupation with 11% (n=18), followed by restaurant/bar 10% (n=16). Residents reported that their place of work was in operation for an average 10.61 months (s.d. = 2.42 months) out of the year. Table 3 and Table 4 provide demographic data.

Table 3: Demographics for West Yellowstone Respondents

Demographics		2019
Gender	**Male**	**48%** (n=75)
	Female	**50%** (n=78)
	Prefer not to answer	**1%** (n=2)
	Age	Range = **20-90** Mean = **57.82** years Std dev. = **16.05** years
Employment	**Employee**	**35%** (n=55)
	Retired	**41%** (n=65)
	Business Owner	**14%** (n=22)
	Manager	**8%** (n=12)
	Unemployed	**0%** (n=0)
	Homemaker	**3%** (n=5)
Children in West Yellowstone School	**Yes**	**14.8%** (n=23)
	If yes, # of children **% of those that responded (Sample size)**	**1** Child: **50%** (n=11) **2** Children: **27%** (n=6) **3** Children: **18%** (n=4) **5** Children: **5%** (n=1)
	Residency in West Yellowstone: Years	Mean = **17.91** years Std dev. = **14.81** years Range = **.166 – 55**
	Residency in West Yellowstone: Months per Year	Mean = **9.96** months Std dev. = **3.20** months Range = **1.5 – 12**

Table 4: Occupation Breakdown of Respondents

Occupation	N	%
Accommodations	22	19%
Retail	18	15%
Restaurant/Bar	16	14%
Guide/Outfitter/Tours/Recreation	11	9%
Finance/Insurance/Real Estate	9	8%
Construction/Manufacturing	9	8%
Government	9	8%
Education/Teacher	5	4%
Gas Station	4	3%
Arts/Entertainment	3	3%
Health Care/Social Services	3	3%
Grocery/Convenience	3	3%
Transportation/Travel	2	2%
Non/Profit	2	2%
Other	1	1%
Average # of Months in Operation	**10.61 months**	
Std. dev =	**2.42 months**	
Range =	**5 - 12**	

Quality of Life

Residents were asked to respond to the 24 QOL characteristics in three separate ways: importance of that characteristic to them personally, satisfaction with the performance of that characteristic at a community level, and perceived impact a shuttle system may have on that specific QOL characteristic. Of the 24 QOL characteristics, the three highest mean values for QOL characteristics in regard to their importance on a 5-point scale were 'Clean water' ($\bar{x}$ = 4.91, s.d. = .386), 'Clean air' ($\bar{x}$ = 4.85, s.d. = .388), and 'Controlled litter' ($\bar{x}$ = 4.77, s.d.= .749). The middle point of the scale is three, where the resident is neither agreeing nor disagreeing that this characteristic is important to them nor are indicating it is under or over performing at the community level. In a gateway community located on the border of one of the world's most famous natural protected areas, it is no surprise that these elements of their

community are of great importance to the people who call West Yellowstone home. Similarly, the three highest mean values related to performance satisfaction with QOL variables were 'Clean water' ($\bar{x}$ = 4.56, s.d. = .698), 'Clean air' ($\bar{x}$ = 4.48, s.d. = .754), and 'Opportunities for outdoor recreation' ($\bar{x}$ = 4.18, s.d. = .946). It should be reassuring to residents of West Yellowstone to know that not only are these components of their community important to most residents, they are also performing to a high standard of satisfaction. Table 5 provides means and standard deviations for all 24 QOL characteristics with respect to their importance, performance satisfaction, and QOL score. Table 5 is sorted from highest QOL score to lowest.

Table 5: Mean Values for Importance, Performance, and Calculated QOL

Items	Importance*	Performance*	Current QOL*
Clean water	4.91 (.386)	4.56 (.698)	**17.69 (3.48)**
Clean air	4.85 (.388)	4.48 (.754)	**17.24 (3.79)**
Opportunities for outdoor recreation	4.61 (.749)	4.18 (.946)	**15.58 (4.38)**
Quality of the natural environment	4.75 (.582)	4.08. (.957)	**15.27 (4.54)**
Amount of wildlife	4.44 (.825)	4.15 (1.012)	**15.19 (4.32)**
Prevention of crime and vandalism	4.76 (.651)	4.09 (.865)	**15.16 (4.24)**
Preserving undeveloped natural areas	4.47 (.810)	3.94 (.956)	**14.33 (4.24)**
***If a homeowner* - The value of my house and/or la**	4.51 (.888)	3.76 (1.016)	**13.48 (4.56)**
Quality of roads	4.28 (.878)	3.64 (.993)	**12.74 (4.45)**
Local tax revenue	4.3 (.910)	3.54 (1.068)	**12.43 (4.66)**
Availability of hotels	3.06 (1.337)	3.67 (1.143)	**12.06 (3.93)**
Awareness of local culture	3.93 (1.077)	3.39 (.934)	**11.72 (3.71)**
Controlled litter	4.77 (.519)	3.36 (1.239)	**11.67 (5.84)**
Amount of noise heard	4.08 (1.029)	3.43 (1.114)	**11.54 (4.63)**
Community pride	4.19 (.988)	3.3 (1.106)	**11.40 (4.75)**
Variety of entertainment and special events	3.77 (1.134)	3.37 (1.010)	**11.25 (4.16)**
Stores and restaurants owned by local residents	4.16 (1.006)	3.25 (1.218)	**11.03 (5.21)**
Availability of parking	3.81 (1.166)	3.26 (1.122)	**10.95 (4.51)**
Infrastructure for bicyclists and pedestrians	3.9 (1.143)	3.18 (1.203)	**10.37 (4.86)**
Controlled traffic	4.33 (.858)	3.01 (1.205)	**9.86 (5.17)**
Public transportation	2.9 (1.186)	2.97 (1.190)	**9.77 (3.90)**
Enough good jobs for residents	4.47 (.894)	2.88 (1.264)	**9.39 (5.64)**
Traffic flow	4.23 (.927)	2.81 (1.163)	**8.92 (4.89)**
Affordable housing for average income residents	4.39 (.969)	2.16 (1.190)	**6.15 (5.01)**

***Importance scale: 1 = not at all important to 5 = extremely important.**
***Performance scale: 1 = not at all satisfied to 5 = extremely satisfied.**
***QOL Range: 1 to 20 (see Figure 5).**
Mean (std. dev) for all values.

In contrast, the three QOL characteristics that had the lowest mean values in regard to their importance to residents were 'Public transportation' ($\bar{x}$ = 2.9, s.d. = 1.186), 'Availability of hotels' ($\bar{x}$ = 3.06, s.d. = 1.337), and 'Variety of entertainment and special events' ($\bar{x}$ = 3.77, s.d. = 1.134). It is worth noting that the three characteristics that produced the lowest mean values for their importance to residents were all near or above the scale midpoint of three. Furthermore, the three QOL characteristics with the lowest mean values in relation to their current performance satisfaction were 'Affordable housing for average income residents' ($\bar{x}$ = 2.16, s.d. = 1.190), 'Traffic flow' ($\bar{x}$ = 2.81, s.d. = 1.163), and "Enough good jobs for residents' ($\bar{x}$ = 2.88, s.d. = 1.264). To provide some reference as to how important residents felt these items were, their corresponding means were 4.39 (s.d. = .969), 4.23 (s.d. = .927), and 4.47 (s.d. = .894), respectively.

Once mean values for both importance and performance satisfaction were calculated, a QOL score was created using the Andereck and Nyaupane (2011) adapted scoring model. The QOL score allows for importance to serve as a baseline to then measure performance satisfaction. If a variable is highly important to a resident (e.g., 4 or 5), it is only logical that residents would then want that variable to perform well. Therefore, the higher the importance score the higher the satisfaction score needs to be in order to produce a positive result. If the importance score is high but satisfaction is low, the QOL score is able to capture displeasure accordingly. Mean QOL scores can range from 1-20, with one being the worst possible score and 20 being the best. Based on this formula, the three variables with the highest combined QOL score are the exact same as the three variables provided in the previous paragraph – 'Clean water' ($\bar{x}$ = 17.69, s.d. = 3.48), 'Clean air' ($\bar{x}$ = 17.24, s.d. = 3.79), and 'Opportunities for outdoor recreation' ($\bar{x}$ = 15.58, s.d. = 4.38). In comparison, the three variables that produced the

lowest combined QOL scores were 'Affordable housing for average income residents' ($\bar{x}$ = 6.15, s.d. = 5.01), 'Traffic flow' ($\bar{x}$ = 8.92, s.d. = 4.89), and 'Enough good jobs for residents' ($\bar{x}$ = 9.39, s.d. = 5.64). Table 6 provides means and standard deviations for all 24 QOL characteristics with respect to their importance, performance satisfaction, and QOL score. Table 5 is sorted from highest QOL score to lowest.

Respondents were then asked to provide an assessment of whether a shuttle system would have a positive, negative, or unnoticeable impact on the QOL characteristics. In order to produce a shuttle-effect mean for each variable, the (-2, -1, 0, 1, 2) scores were recoded ranging from -3 to +3, where -2 equals -3, -1 equals -2, 0 equals 1, 1 equals 2, and 2 equals 3 (-3, -2, 1, 2, 3). This recoding is done because the shuttle effect score is used as a multiplier for the QOL score, therefore a no change score would have to be represented by a score of 1. If left in its original format, where zero is the midpoint for no change, a mean score of zero would produce a multiplier that would wipe out the current QOL score when multiplied, thus defeating the purpose of the analysis. Any mean score above 1 would indicate residents perceived the shuttle would have a positive impact, where as a mean score below 1 would indicate residents perceived the shuttle would have a negative impact.

The three characteristics in which residents of West Yellowstone perceived a shuttle would have the most positive impact on their QOL were on 'Public transportation' ($\bar{x}$ = 1.55, s.d. = 1.61), 'Controlled traffic' ($\bar{x}$ = 1.5, s.d. = 1.88), and 'Traffic flow' ($\bar{x}$ = 1.49, s.d. = 1.69). Conversely, the three variables residents felt a shuttle would have the most negative impact on were 'Affordable housing for average income residents' ($\bar{x}$ = .38, s.d. = 1.59), 'Availability of hotels' ($\bar{x}$ = .64, s.d. = 1.44), and 'Enough good jobs for residents' ($\bar{x}$ = .69, s.d. = 1.51). Overall, residents were split down the middle between their optimism and concern

in regard to the effect a shuttle system would have, as 12 shuttle effect means were greater than 1 (positive impact) and 12 shuttle effect means were less than 1 (negative impact). This split is evident in the qualitative/open-ended responses presented at the end of this chapter. Table 6 provides information related to the perceived shuttle effect.

Table 6: Shuttle Effect Scores

Characteristics	Shuttle Effect Mean (s.d)
Public transportation	1.55 (1.61)
Controlled traffic	1.5 (1.88)
Traffic flow	1.49 (1.69)
Quality of the natural environment	1.35 (1.71)
Amount of wildlife	1.35 (1.37)
Clean air	1.32 (1.73)
Clean water	1.3 (1.27)
Controlled litter	1.2 (1.86)
Preserving undeveloped natural areas	1.14 (1.64)
Infrastructure for bicyclists and pedestrians	1.05 (1.62)
Community pride	1.02 (1.23)
Variety of entertainment and special events	1.01 (1.07)
Amount of noise heard	0.99 (1.78)
Opportunities for outdoor recreation	0.97 (1.43)
Quality of roads	0.93 (1.78)
Prevention of crime and vandalism	0.9 (1.27)
Stores and restaurants owned by local residents	0.88 (1.33)
Local tax revenue	0.83 (1.57)
***If a homeowner* - The value of my house and/or land**	0.78 (1.30)
Awareness of local culture	0.78 (1.28)
Availability of parking	0.74 (2.28)
Enough good jobs for residents	0.69 (1.51)
Availability of hotels	0.64 (1.44)
Affordable housing for average income residents	0.38 (1.59)
Shuttle Effect: -3 = negatively impacted to +3 = positively impacted	

When multiplying the QOL mean scores by the shuttle effect, a new Projected Quality of Life (PQOL) score was calculated that captured importance, satisfaction, and perceived impact.

With mean shuttle effect scores potentially ranging from -3 to +3, the new range for PQOL scores is -60 to +60. After application, the three new highest PQOL variables were 'Clean air' ($\bar{x}$ = 23.18, s.d. = 30.27), 'Clean water' ($\bar{x}$ = 22.93, s.d. = 22.99), and 'Quality of the natural environment' ($\bar{x}$ = 21.41, s.d. = 27.51) tied along with 'Amount of wildlife' ($\bar{x}$ = 21.41, s.d. 21.60). The three lowest PQOL variables were 'Affordable housing for average income residents' ($\bar{x}$ = 0.01, s.d. = 7.02), 'Enough good jobs for residents' ($\bar{x}$ = 7.04, s.d. = 17.17), and 'Availability of hotels' ($\bar{x}$ = 7.56, s.d. = 19.37). When comparing the new PQOL scores with the previous QOL scores, the variables with the greatest positive change were 'Clean Air' ($\bar{x}$ = +6.05, s.d. = 29.61) and 'Quality of the natural environment'($\bar{x}$ = +6.05, s.d. = 26.55) tied in first, followed by 'Amount of wildlife' ($\bar{x}$ = +6.03, s.d. = 20.90). The PQOL scores with the greatest negative mean change were 'Affordable housing for average income residents' ($\bar{x}$ = -6.17, s.d. = 11.13), 'Availability of hotels' ($\bar{x}$ = -4.52, s.d. = 19.02), and '*If a homeowner*- The value of my house and/or land' ($\bar{x}$ = -3.58, s.d. = 19.06). Table 7 provides means and standard deviations for current QOL, Shuttle Effect, PQOL scores along with the measured change from the current state of QOL. Table 7 is sorted by PQOL scores from highest to lowest.

Table 7: Perceived Change for QOL Characteristics

Characteristics	Current QOL Mean (s.d.)	Shuttle Effect Mean (s.d.)	Projected QOL Mean (s.d.)	Change in QOL Mean (s.d.)
Clean air	17.24 (3.79)	1.32 (1.73)	23.18 (30.27)	6.05 (29.61)
Clean water	17.69 (3.48)	1.30 (1.27)	22.93 (22.99)	5.23 (22.70)
Quality of the natural environment	15.27 (4.54)	1.35 (1.71)	21.41 (27.51)	6.05 (26.55)
Amount of wildlife	15.19 (4.32)	1.35 (1.37)	21.41 (21.60)	6.03 (20.90)
Preserving undeveloped natural areas	14.33 (4.24)	1.14 (1.64)	17.15 (24.77)	2.74 (24.15)
Opportunities for outdoor recreation	15.58 (4.38)	.97 (1.43)	15.8 (22.73)	0.15 (22.01)
Controlled traffic	9.86 (5.17)	1.50 (1.88)	15.68 (21.36)	5.78 (19.40)
Controlled litter	11.67 (5.84)	1.2 (1.86)	15.3 (24.55)	3.42 (23.28)
Public transportation	9.77 (3.90)	1.55 (1.61)	15.15 (17.18)	5.40 (16.21)
Prevention of crime and vandalism	15.16 (4.24)	.90 (1.27)	14.37 (19.56)	-0.77 (18.74)
Traffic flow	8.92 (4.89)	1.49 (1.69)	13.25 (17.63)	4.44 (16.17)
Quality of roads	12.74 (4.45)	.93 (1.78)	12.81 (23.59)	0.05 (22.67)
Community pride	11.40 (4.75)	1.02 (1.23)	12.43 (17.05)	0.95 (15.64)
Infrastructure for bicyclists and pedestrians	10.37 (4.86)	1.05 (1.62)	11.67 (18.30)	1.23 (17.23)
Variety of entertainment and special events	11.25 (4.16)	1.01 (1.07)	11.61 (13.53)	0.47 (12.38)
Stores and restaurants owned by local residents	11.03 (5.21)	.88 (1.33)	10.86 (18.03)	-0.25 (16.46)
Amount of noise heard	11.54 (4.63)	.99 (1.78)	10.78 (22.38)	-0.79 (22.22)
***If a homeowner* - The value of my house and/or land**	13.48 (4.56)	.78 (1.30)	9.85 (19.18)	-3.58 (19.06)
Awareness of local culture	11.72 (3.71)	.78 (1.28)	9.61 (16.26)	-2.20 (15.64)
Local tax revenue	12.43 (4.66)	.83 (1.57)	9.15 (22.81)	-3.22 (23.24)
Availability of parking	10.95 (4.51)	.74 (2.28)	8.86 (26.46)	-2.10 (26.11)
Availability of hotels	12.06 (3.93)	.64 (1.44)	7.56 (19.37)	-4.52 (19.02)
Enough good jobs for residents	9.39 (5.64)	.69 (1.51)	7.04 (17.17)	-2.38 (16.55)
Affordable housing for average income residents	6.15 (5.01)	.38 (1.59)	0.01 (7.02)	-6.17 (11.13)
Current QOL scale: 1-20 **Shuttle Effect scale: -3 to +3** **Projected Quality of Life and Change scale : -60 to + 60**				

To test whether the proposed shuttle produced any statistically significant differences for each QOL characteristic, a one sample Wilcoxon Signed Rank Test was conducted. A Wilcoxon Signed Rank Test is a nonparametric test that offers an alternative for testing statistically significant differences on the median (as opposed to the mean) in the presence of skewed or heavy tailed outliers (Ott & Longnecker, 2016). In the case of this study, the change in QOL distributions featured some skewness and outliers for several of the characteristics thus violating required assumptions of normality when using t-procedures; therefore, a t-procedure was avoided. On the next page, Table 8 displays median values for current QOL and PQOL along with the standardized test statistic (z-score) for each QOL characteristic using a 95% confidence interval. A one sample signed rank test uses the following two-sided hypothesis for the perceived change in QOL (i.e., PQOL - QOL) for each of the 24 QOL characteristics:

$$H_0: M = M_0 \quad \text{vs.} \quad H_a: M \neq M_0$$

M_0 = Hypothesized median

M = Population median

H_0: The change in the population median is equal to the change in the hypothesized median (0 or no change)

H_a: The change in the population median is not equal to the hypothesized median (0 or no change)

Table 8: Signed Rank Test on Perceived Change in QOL

Signed Rank Test			
Characteristics	Current QOL Median	Projected QOL Median	Standardized Test Statistic (Z)
Clean air	20.0	20.0	2.297*
Clean water	20.0	20.0	2.902**
Quality of the natural environment	15.0	20.0	3.331**
Amount of wildlife	15.0	20.0	3.603**
Preserving undeveloped natural areas	15.0	20.0	1.688
Opportunities for outdoor recreation	15.0	20.0	-0.016
Prevention of crime and vandalism	15.0	15.0	-0.640
Quality of roads	14.0	14.5	0.414
If a homeowner - The value of my house and/or land	14.0	14.5	-1.684
Local tax revenue	14.0	13.0	-0.674
Amount of noise heard	12.0	14.0	0.573
Availability of hotels	12.0	10.0	-3.004**
Controlled traffic	10.0	18.0	4.624**
Controlled litter	10.0	15.0	3.16**
Public transportation	10.0	14.0	4.594**
Traffic flow	10.0	14.0	4.318**
Community pride	10.0	10.0	1.350
Infrastructure for bicyclists and pedestrians	10.0	10.0	1.917
Variety of entertainment and special events	10.0	10.0	0.642
Stores and restaurants owned by local residents	10.0	10.0	-0.098
Awareness of local culture	10.0	10.0	-1.819
Availability of parking	10.0	14.0	-0.319
Enough good jobs for residents	10.0	10.0	-0.702
Affordable housing for average income residents	5.0	0.0	-6.095**
Current QOL scale: 1-20 Projected Quality of Life scale : -60 to + 60 *p=.05 **p=.005			

Of the 24 QOL characteristics (Table 8), ten characteristics were significantly different when assessing the current QOL median and PQOL median. The significant differences between the current state of QOL and the projected state of QOL as a result of the introduction of shuttle concept were found in the following characteristics: Clean air ($z = 2.297$, $p<.05$), Clean water ($z = 2.902$, $p<.005$), Quality of the natural environment ($z = 3.331$, $p<.005$), Amount of wildlife ($z = 3.603$, $p<.005$), Availability of hotels ($z = -3.004$, $p<.005$), Controlled traffic ($z = 4.624$, $p<.005$), Controlled litter ($z = 3.160$, $p<.005$), Public transportation ($z = 4.594$, $p<.005$), Traffic flow ($z = 4.318$, $p<.005$), and Affordable housing for average income residents ($z = -6.095$, $p<.005$). These results show that residents perceived significant differences in the change to some environmental characteristics of their community (e.g., Clean water, Amount of wildlife, and the Quality of the natural environment), significant differences in the change to some transportation related characteristics (e.g., Controlled traffic, Traffic flow, and Public transportation), and significant differences in the change to some economic characteristics (e.g., Availability of hotels and Affordable housing for average income residents). The significance of these differences will be discussed further in Chapter 5.

Attitudes towards Tourism and Support for ATS

Residents were asked eight questions relating to their attitudes towards tourism in addition to their support for ATS within their community. All eight were Likert scales ranging from 1-5, where 1 represented ‘Strongly Disagree’ and 5 represented ‘Strongly Agree’. When asked if a shuttle bus system would increase parking availability in town, 57% (n=88) of residents stated they either disagreed or strongly disagreed with that statement. Only 20% (n=30) of residents stated they either agreed or strongly agreed with the statement. Overall, residents reported a mean of 2.37 (s.d. = 1.361). In addition, residents were asked if they felt their

community could handle more tourists. Thirty-one percent (n=48) of residents strongly disagreed with that statement, with another 17% (n=27) disagreeing. Overall, residents reported a mean score of 2.59 (s.d. = 1.362). Table 9 and Table 10 provide detailed information to the previous two questions.

Table 9: A Shuttle Bus System Would Increase Parking Availability in Town

		N	%
A shuttle bus system would increase parking availability in town.	Strongly disagree	57	37%
	Disagree	31	20%
	Neither Agree or Disagree	35	23%
	Agree	12	8%
	Strongly agree	18	12%
	Total	**153**	**100%**
	Mean	**2.37**	
	Std. Deviation	**1.361**	

Table 10: My Community Can Handle More Tourists

		N	%
My community can handle more tourists.	Strongly disagree	48	31%
	Disagree	27	17%
	Neither Agree or Disagree	38	25%
	Agree	25	16%
	Strongly agree	17	11%
	Total	**155**	**100%**
	Mean	**2.59**	
	Std. Deviation	**1.362**	

Residents were then asked if they would support parking infrastructure development in W. Yellowstone for a shuttle bus system. On this question responses from residents were more evenly distributed with 29% (n=44) strongly disagreeing and 22% (n=34) strongly agreeing, producing a mean score of 2.94 (s.d. = 1.543). In a similar vein, residents were also asked if they felt a shuttle bus system from W. Yellowstone to Old Faithful would help reduce traffic

congestion in town. Residents were again fairly evenly distributed in their responses with 25% (n=39) strongly disagreeing, 24% (n=37) neither agreeing or disagreeing, and 16% (n=25) strongly agreeing to produce an overall mean score of 2.85 (s.d. = 1.410). Displayed in Table 11 and Table 12 is information regarding residents' responses to the previous two questions.

Table 11: Support for Parking Infrastructure Development in W. Yellowstone for a Shuttle Bus System

		N	%
I would support parking infrastructure development in W. Yellowstone for a shuttle bus system.	Strongly disagree	44	29%
	Disagree	21	14%
	Neither Agree or Disagree	23	15%
	Agree	32	21%
	Strongly agree	34	22%
	Total	**154**	**100%**
	Mean	**2.94**	
	Std. Deviation	**1.543**	

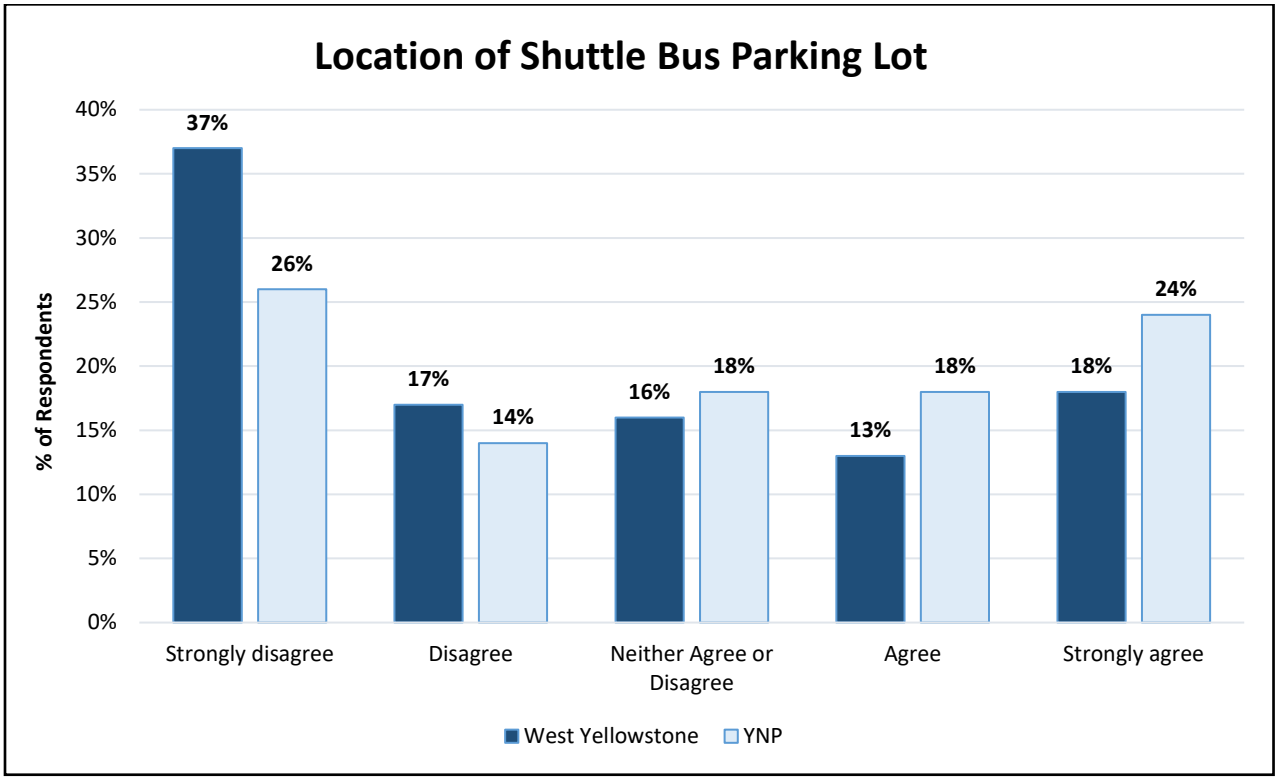
Table 12: Perceptions of Shuttle's Ability to Help Reduce Traffic Congestion in Town

		N	%
A shuttle bus system from W. Yellowstone to Old Faithful would help reduce traffic congestion in town.	Strongly disagree	39	25%
	Disagree	25	16%
	Neither Agree or Disagree	37	24%
	Agree	29	19%
	Strongly agree	25	16%
	Total	**155**	**100%**
	Mean	**2.85**	
	Std. Deviation	**1.41**	

Residents were also asked to give their opinion as to where a shuttle bus parking lot or terminal should originate, either in the town of West Yellowstone or within the Yellowstone National Park boundary. Residents were more in favor of a shuttle bus parking lot that originated within the Park boundary as opposed to in the town itself. Residents were stronger in their

agreement that the parking lot should be located within the Park boundary, as well as their disagreement that the shuttle bus parking lot should be located within town. Displayed in Figure 10 is a side-by-side comparison for the two proposed shuttle parking lot locations.

Figure 10: Residents' Preferences for Shuttle Bus Parking Lot Locations



Overall, the mean value for a parking lot that originated in West Yellowstone was 2.57 (s.d. = 1.521) compared to a mean value of 2.99 (s.d. = 1.533) for a parking lot that originated within the Yellowstone National Park boundary, indicating there is more overall support for a shuttle parking lot located within the Park. Residents are not in unison over their support of where a shuttle parking lot should originate. Table 13 and Table 14 provide information regarding residents' responses to the previous two questions.

Table 13: Resident Preferences for a Shuttle System Originating in the town of West Yellowstone

		N	%
A shuttle bus parking lot should be located within the town of West Yellowstone.	Strongly disagree	56	37%
	Disagree	26	17%
	Neither Agree nor Disagree	24	16%
	Agree	19	13%
	Strongly agree	27	18%
	Total	**152**	100%
	Mean	**2.57**	
	Std. Deviation	**1.521**	

Table 14: Resident Preferences for a Shuttle System Originating within Yellowstone National Park

		N	%
A shuttle bus parking lot should be located within the Yellowstone National Park boundary, not in town.	Strongly disagree	40	26%
	Disagree	22	14%
	Neither Agree or Disagree	27	18%
	Agree	27	18%
	Strongly agree	37	24%
	Total	**153**	100%
	Mean	**2.99**	
	Std. Deviation	**1.533**	

A majority of residents (57%) either strongly disagreed or disagreed that they would personally benefit from more tourism development in their community. In fact, of the eight attitude questions asked of residents, this question produced the lowest mean agreement score of 2.33 (s.d. = 1.23). Residents also strongly disagreed (42%) with the statement that only a small number of residents benefit economically from tourism. Overall, residents reported a mean of 2.5 (s.d. = 1.552). Table 15 and Table 16 provide complete information to residents' responses to these two questions.

Table 15: Perception of Personal Benefit Gained from More Tourism Development

		N	%
I would personally benefit from more tourism development in my community.	Strongly disagree	52	34%
	Disagree	34	22%
	Neither Agree or Disagree	41	27%
	Agree	16	10%
	Strongly agree	10	7%
	Total	**153**	**100%**
	Mean	**2.33**	
	Std. Deviation	**1.23**	

Table 16: Perception of the Number of Residents Who Benefit from Tourism

		N	%
Only a small number of residents benefit economically from tourism.	Strongly disagree	65	42%
	Disagree	22	14%
	Neither Agree or Disagree	19	12%
	Agree	23	15%
	Strongly agree	26	17%
	Total	**155**	**100%**
	Mean	**2.5**	
	Std. Deviation	**1.552**	

In response to the question about the role tourism plays in West Yellowstone's economy, 98% (n=144) of residents said it played either a large or dominant role. Only a small percentage of residents (3%) stated that they have no contact at all with tourists in their community while 19% (n=30) reported they have continual contact with tourists. When asked how knowledgeable they felt they were in regard to the tourism industry in their community, 67% (n=104) of residents reported they were either very knowledgeable or extremely knowledgeable. Only 1% (n=2) of residents felt they had no knowledge of the tourism industry at all. Residents were fairly split on the degree to which they felt they currently benefitted from tourism. Fourteen percent (n=22) felt they received no benefit from tourism while an identical 14% (n=22) felt they

received an extreme personal benefit from tourism, producing a mean score of 3.03 (s.d. = 1.281). Lastly, 47% (n=74) of residents reported that they felt uninvolved in the tourism decision making in their community. Table 17 reports responses for residents' relationship to the tourism industry.

Table 17: Residents' Relationship to the Tourism Industry

Tourism Relationship	Measurement						
	(1)	(2)	(3)	(4)	(5)		
What role does tourism play in West Yellowstone's economy?	No Role	Slight Role	Moderate Role	Large Role	Dominate Role	Mean	Std. Dev.
	1	0	2	28	126	**4.77**	**0.53**
	1%	0%	1%	18%	80%		
How knowledgeable would you say you are in regard to the tourism industry in West?	Not at all	Slightly	Moderately	Very	Extremely	Mean	Std. Dev.
	2	9	41	59	45	**3.87**	**0.942**
	1%	6%	26%	38%	29%		
How involved do you feel you are with tourism decision making in your community?	No At All	Slightly	Moderately	Very	Extremely	Mean	Std. Dev.
	74	39	33	8	3	**1.9**	**1.026**
	47%	25%	21%	5%	2%		
Please describe the amount of contact you have with tourists in your community.	No Contact	Slight Contact	Moderate	Large Contact	Continual	Mean	Std. Dev.
	5	45	43	33	30	**3.26**	**1.16**
	3%	29%	28%	21%	19%		
To what degree do you feel you currently benefit personally from tourism?	No Benefit	Slight Benefit	Moderate Benefit	Large Benefit	Extreme Benefit	Mean	Std. Dev.
	22	36	34	41	22	**3.03**	**1.281**
	14%	23%	22%	26%	14%		

Exploratory Factor Analysis: TQOL

To understand the underlying structure and possible relationship amongst the perceived change to QOL characteristics an Exploratory Factor Analysis was conducted. A factor analysis serves as a data reduction tool as well as for ascertaining the minimum number of hypothetical

factors that can account for the observed covariation (Kim & Mueller, 1991). Principal components factor analysis with varimax rotation of the ΔQOL characteristics resulted in two factors with items that loaded reasonably well and have acceptable reliability. Due to the small sample size relative to the number of characteristics being analyzed, a parallel analysis assisted in producing mean eigenvalues to be used as cutoff points when assessing eigenvalues produced in the factor analysis. Based on this parallel analysis and scree plot data, variables were forced into two factors. This also was done to reduce the number of factors that cross-loaded before applying the parallel analysis.

Table 18 shows the three factors are 1) community order and the natural environment, which includes 14 characteristics related to community order and the condition of the natural environment and 42.05% of variance; 2) community preservation and economic security, which includes nine characteristics related to preserving the current state of community culture and maintaining economic security and 8.75% of variance; 3) affordable housing, which includes the sole characteristic related to affordable housing.

One characteristic, Affordable Housing, did not load with either of the two factors. Based on the current poor performance of this characteristic in the community with respect to QOL, reporting the largest perceived negative impact to any QOL characteristic, and generating numerous open-ended comments of concern toward that characteristic, Affordable Housing was retained as its own third factor. Since this factor contains only a single characteristic, measures of reliability (such as a Cronbach's alpha) cannot be computed. Therefore, one should exercise caution when interpreting these results. Table 18 provides the factor loadings, eigenvalues, Cronbach's alphas, and the percentage of variance explained by the factors.

Table 18: Factor Analysis of Change in Quality of Life Factors

Factors	Factor Loadings	Eigenvalue	% of Variance Explained
Community Order and the Natural Environment (ΔQOL$_{CONE}$)			
Traffic Flow	0.785		
Quality of Roads	0.782		
Quality of the Natural Environment	0.781		
Amount of Wildlife	0.750		
Controlled Litter	0.718		
Clean Air	0.703		
Availability of Parking	0.692		
Infrastructure for Bicyclists and Pedestrians	0.665		
Controlled Traffic	0.626		
Amount of Noise Heard	0.601		
Preserving Undeveloped Natural Areas	0.590		
Public Transportation	0.583		
Clean Water	0.524		
Prevention of Crime and Vandalism	0.461		
α = **.919**		9.67	42.05
Community Preservation and Economic Security (ΔQOL$_{CPES}$)			
Awareness of Local Culture	0.841		
Opportunities for Outdoor Recreation	0.727		
Community Pride	0.719		
Stores and Restaurants Owned by Local Residents	0.641		
Local Tax Revenue	0.607		
Variety of Entertainment and Special Events	0.603		
Enough Good Jobs for Residents	0.509		
The Value of My House and/or Land	0.505		
Availability of Hotels	0.418		
α = **.832**		2.01	8.75

*** The item for Affordable Housing did not load on the prior two factors.**

Descriptive statistics were also calculated to show the direction of perceived change in relation to each factor. The perceived impact on the factor Community Order and the Natural Environment ($\bar{x}$ = 3.06, s.d. = 21.85) was the only positively perceived impact for all three factors, followed then by the perceived negative impact on the Community Preservation and Economic Security ($\bar{x}$ = -1.62, s.d. = 17.78), and the perceived negative impact on Affordable Housing ($\bar{x}$ = -6.17, s.d. = 11.13). Like much of the other findings in relation to the shuttle's

perceived effect, residents perceive positive impacts of different elements of their community, elements that are important and both performing at satisfactory and unsatisfactory levels. Table 19 displays the mean, standard deviation, and median for perceived changes to QOL factors.

Table 19: Mean and Standard Deviations for Change in QOL Factor Scores

Factors	Mean	Standard Deviation	Median
Community Order and Natural Environment (ΔQOLONE)	3.06	21.85	0
Community Preservation and Economic Security (ΔQOLCPES)	-1.62	17.78	0
Affordable Housing (ΔQOLHOUSING)	-6.17	11.13	-5

Note: Mean and Std. Dev. Range = -60 to 60
Mean = 0 represents no change/scale midpoint

Regression Analysis

After QOL factors were created and analyzed, a series of linear regression analyses were conducted to test how residents' relationship to the tourism industry affected their perceptions of the shuttle's impact on their QOL. Bivariate correlation analysis using a two-tailed test for significance assisted in understanding relationships between all independent and predictor variables, avoiding collinearity and reducing the number of independent variables to be used in regression analysis to seven. The seven different independent variables include: gender with two categories – male and female (due to n=2 for 'Prefer not to answer' those responses were coded as 'missing' for this analysis), age of respondent, involvement with tourism decision making, level of contact the resident has with tourists, the degree to which they feel they personally benefit from tourism, number of years in the community, and whether they had children in the West Yellowstone school system.

Two of the three QOL equations exhibited significant effects of residents' relationship to the tourism industry on how QOL perceptions would be impacted by a shuttle: Community Preservation and Economic Security (ΔQOL_{CPES}), and Affordable Housing ($\Delta QOL_{HOUSING}$). The dependent variable Community Order and the Natural Environment (ΔQOL_{CONE}) did not show significant predictions. Table 20 provides a model summary for the regression analysis conducted on the Community Preservation and Economic Security factors. On the next page, Table 21 displays the linear regression coefficients followed by interpretations of how each predictor variable influences the dependent response.

Table 20: Regression Analysis Model Summary for Community Preservation and Economic Security

Regression Analysis - Model Summary						
Community Preservation and Economic Security (ΔQOLCPES)	**R Square**	**Adjusted R Square**	**F Change**	**df1**	**df2**	**Sig. F Change**
Model 1	0.075	0.004	1.061	7	91	0.395
Model 2	0.075	0.015	0.000	1	91	0.988
Model 3	0.071	0.021	0.492	1	92	0.485
Model 4	0.067	0.027	0.390	1	93	0.534
Model 5	0.063	0.034	0.338	1	94	0.563
Model 6	0.056	0.037	0.719	1	95	0.398

Table 21: Coefficients for Perceived Change to Community Preservation and Economic Security Factors

Regression Analysis - Coefficients					
Community Preservation and Economic Security (ΔQOL$_{CPES}$)	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	-0.509	0.918		-0.554	0.58061
Gender	0.003	0.216	0.002	0.015	0.98821
What is your age?	0.009	0.009	0.144	1.090	0.27843
Children in the West Yellowstone Public School System	-0.262	0.342	-0.090	-0.766	0.44543
Years lived in West Yellowstone	-0.013	0.008	-0.195	-1.649	0.10264
Perceptions of benefitting personally from tourism	0.199	0.107	0.253	1.863	0.06569
Amount of contact with tourists	0.083	0.119	0.089	0.695	0.48860
Perceptions of involvement in tourism decision making	-0.091	0.118	-0.097	-0.773	0.44181
(Constant)	-0.502	0.787		-0.638	0.52529
What is your age?	0.009	0.008	0.144	1.130	0.26159
Children in the West Yellowstone Public School System	-0.262	0.340	-0.090	-0.771	0.44291
Years lived in West Yellowstone	-0.013	0.008	-0.195	-1.661	0.10013
Perceptions of benefitting personally from tourism	0.199	0.106	0.253	1.874	*0.06412
Amount of contact with tourists	0.083	0.118	0.089	0.701	0.48491
Perceptions of involvement in tourism decision making	-0.091	0.117	-0.097	-0.784	0.43506
(Constant)	-0.314	0.738		-0.426	0.67145
What is your age?	0.008	0.008	0.118	0.969	0.33490
Children in the West Yellowstone Public School System	-0.214	0.332	-0.073	-0.645	0.52068
Years lived in West Yellowstone	-0.014	0.008	-0.212	-1.854	*0.06685
Perceptions of benefitting personally from tourism	0.223	0.101	0.283	2.217	**0.02909
Perceptions of involvement in tourism decision making	-0.070	0.112	-0.075	-0.624	0.53400
(Constant)	-0.420	0.716		-0.586	0.55905
What is your age?	0.008	0.008	0.121	1.004	0.31788
Children in the West Yellowstone Public School System	-0.191	0.329	-0.065	-0.581	0.56259
Years lived in West Yellowstone	-0.014	0.007	-0.221	-1.948	*0.05443
Perceptions of benefitting personally from tourism	0.196	0.091	0.249	2.162	**0.03319
(Constant)	-0.690	0.543		-1.271	0.20668
What is your age?	0.006	0.007	0.094	0.848	0.39850
Years lived in West Yellowstone	-0.014	0.007	-0.221	-1.954	*0.05364
Perceptions of benefitting personally from tourism	0.203	0.090	0.257	2.258	**0.02621
(Constant)	-0.284	0.256		-1.111	0.26952
Years lived in West Yellowstone	-0.012	0.007	-0.185	-1.768	*0.08016
Perceptions of benefitting personally from tourism	0.173	0.083	0.220	2.096	**0.03868
*** p < .10**					
**** p < .05**					

Two independent variables showed a relationship to the Community Preservation and Economic Security factor. For each increase of one year of residency in West Yellowstone, there is an average decrease in the perceived change of QOL for economic factors of -.012. For each degree of increased personal benefit from tourism there is an average increase in the change in QOL for economic factors of .173. In essence, how long residents had lived in West Yellowstone on average produced increasingly negative perceptions of how the shuttle would change QOL for economic factors. Conversely, the more personal benefit residents perceived from tourism, the more positive their assessments were of the change in QOL for economic factors, on average. Table 22 provides a model summary for the regression analysis conducted on the Affordable Housing factor. On the next page, Table 23 displays the linear regression coefficients followed by interpretations of how each predictor variable influences the dependent response.

Table 22: Regression Analysis Model Summary for Affordable Housing

Regression Analysis - Model Summary						
Affordable Housing (ΔQOLHOUSING)	**R Square**	**Adjusted R Square**	**F Change**	**df1**	**df2**	**Sig. F Change**
Model 1	0.169	0.125	3.888	7	134	0.001
Model 2	0.167	0.130	0.287	1	134	0.593
Model 3	0.163	0.132	0.717	1	135	0.399
Model 4	0.153	0.128	1.579	1	136	0.211

Table 23: Coefficients for Perceived Change to Affordable Housing

Regression Analysis - Coefficients					
Affordable Housing (ΔQOLHOUSING)	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-5.631	7.276		-0.774	0.44039
Gender	-0.947	1.766	-0.043	-0.536	0.59296
What is your age?	0.160	0.067	0.231	2.385	**0.01847
Children in the West Yellowstone Public School System	-8.485	2.789	-0.274	-3.042	**0.00282
Years lived in West Yellowstone	-0.066	0.068	-0.089	-0.962	0.33796
Perceptions of benefitting personally from tourism	-0.719	0.818	-0.084	-0.879	0.38097
Amount of contact with tourists	3.875	0.876	0.407	4.422	**0.00002
Perceptions of involvement in tourism decision making	-1.082	0.979	-0.102	-1.106	0.27061
(Constant)	-7.416	6.451		-1.150	0.25235
What is your age?	0.164	0.066	0.237	2.469	**0.01482
Children in the West Yellowstone Public School System	-8.387	2.776	-0.271	-3.022	**0.00301
Years lived in West Yellowstone	-0.068	0.068	-0.092	-1.003	0.31774
Perceptions of benefitting personally from tourism	-0.689	0.814	-0.081	-0.847	0.39871
Amount of contact with tourists	3.826	0.869	0.401	4.402	**0.00002
Perceptions of involvement in tourism decision making	-1.052	0.974	-0.099	-1.079	0.28238
(Constant)	-9.562	5.927		-1.613	0.10900
What is your age?	0.174	0.065	0.252	2.670	**0.00852
Children in the West Yellowstone Public School System	-8.005	2.736	-0.259	-2.926	**0.00402
Years lived in West Yellowstone	-0.087	0.064	-0.118	-1.358	0.17674
Amount of contact with tourists	3.642	0.841	0.382	4.332	**0.00003
Perceptions of involvement in tourism decision making	-1.202	0.957	-0.113	-1.256	0.21110
(Constant)	-11.455	5.744		-1.994	0.04810
What is your age?	0.174	0.065	0.252	2.664	**0.00864
Children in the West Yellowstone Public School System	-7.290	2.682	-0.235	-2.718	**0.00741
Years lived in West Yellowstone	-0.113	0.061	-0.153	-1.852	*0.06619
Amount of contact with tourists	3.272	0.789	0.343	4.147	**0.00006

*** p < .10**

**** p < .05**

Four independent variables showed a relationship to the Affordable Housing factor. As a binary option (i.e. child enrolled or no child enrolled), the presence of children produces an average decrease in the perceived change of QOL for the Affordable Housing factor. For each degree of contact residents reported with tourists, there is an average change in perceived QOL of 3.272. For each increase of one year of residency in West Yellowstone, there is an average decrease in the perceived change of QOL for housing factors of .113. Each one-year increase in age of the respondent has an average decrease in the perceived change in QOL for housing factors of .174. In summary, the more time residents had spent living in West Yellowstone as well as whether or not the resident had children enrolled in the school system both negatively influenced the affordable housing factor related to QOL. Comparatively, both the age of the respondent and the amount of contact they had with tourists positively influenced their perceptions of the change to the affordable housing factor.

Opened-Ended Responses

Lastly, residents were asked to provide any additional comments they had about West Yellowstone. Of the 160 residents who responded to the survey, 77 (48%) wrote in comments at the end of the survey. Several common themes emerged in these comments, such as:

- **Positive assessments of the potential impact a shuttle may have**
    - "A shuttle system is need[ed] to Old Faithful - but that requires more parking in town! No problem the town can build a parking garage! The town is nothing without tourists"
- **Negative assessments of the potential impact a shuttle may have**
    - "As a previous business owner I believe a shuttle system will dramatically impact the economy of West Yellowstone in a negative way. I do not support a shuttle system for Yellowstone National Park."

- **Concerns over lack of proper services within the community, like medical services and recycling**

    - "Better clinic care. Need some doctors!!"

- **Concerns over the availability of seasonal workers in West Yellowstone**

    - "Without tourism, we have no stable year-round economy. I am concerned with the increasing number of absentee business owners, and the lack of support of community organizations. The lack of seasonal employees continues to be a hurdle for local business owners as well as housing associated to this seasonal demand."

- **Concerns and suggestions related to currently perceived traffic issues**

    - "1. Stop ALL expansions in town (new hotels, townhouses, condos) until the sewer lagoon smells in S.W. Madison Addition are corrected completely. Greed is causing residents to suffer. 2. More marked pedestrian crossing across highway 20 so that residents of Madison Addition can safely walk/bike to pick up mail at post office since there is no mail delivery in town. 3. More 25 mph speed limit signs on Highway 20 4. Ban all noisy motorcycles from the park. There is no reason for motorcycles in the park to be that loud! 5. Prohibit and enforce compression braking as traffic enters the town. They do not have legal muffled systems per MT law. 6. Require valid drivers test for all out of country visitors. They buy fake drivers license online and do not know how to drive."

- **Concerns over decision making made at the local government level**

    - "I feel that the town's council is the "good ole boys" network and are not interested in expanding the potential of West Yellowstone city."

- **Regulations with respect to different elements of park access via West Yellowstone**

    - "Please do not reserve seeing the park to shuttle on bus! it would limit visitation extremely! that is the reason I won't go to Alaska. Because you can only see Denali by bus. Where do you think the people on the shuttles will be parking their own cars?!"

The one theme that dominated the residents' comments focused on the need for more affordable housing in their community. As previously mentioned in the results section, the

variable that exhibited both the lowest satisfaction mean and QOL mean score was 'Affordable housing for average income residents' (2.16 & 6.17, respectively). It is apparent in both the quantitative variable analysis and qualitative text responses that residents are gravely concerned about affordable housing in West Yellowstone. Examples of some concerns expressed over affordable housing are displayed verbatim below.

- "Any economic development should also include affordable housing for the middle class. A $250,000 house is not affordable to your average resident."
- "I think we could benefit in more housing for families and other summer workers. We have a lot of hotels around in town and the businesses are always hiring but where are they going to live? Housing is a very big issue here in West Yellowstone."
- "[We] need more housing for the working people that keep the businesses open throughout the year to keep the tourists coming. Without tourists there will be no businesses, less people to fill positions needed to keep those businesses up and running. Basically NEED affordable housing for the seasonal/full time employees and families to keep West Yellowstone economically solvent!"
- "Employees come and go like the wind. Big turnaround. A lot of employees provide housing for associates."
- "Harder and harder to find employee housing. Cost of living is getting impossible to afford."
- "Housing is a big problem to $$ for young families like mine if you want to live here."
- "Needs affordable housing more for year-round families to do with kids. Local govt need to diversify, do they want town to grow or not?"

Conclusion and Implications

Chapter 5 provides discussion and analysis of results from the previous chapter. Provided are conclusions for the three research questions and their implications for stakeholders. Lastly, suggestions for future research are presented.

Research Question One:

How do residents of West Yellowstone currently perceive their quality of life?

Research question one served as the foundation of this study. Without having some initial understanding of the current state of QOL for residents of West Yellowstone, the analysis for understanding how a shuttle would affect QOL would be a moot point. After conducting this initial step, several conclusions can be made. First, residents of West Yellowstone place a high importance on the environmental characteristics of their community. Of the top 10 most important QOL characteristics, seven characteristics were related to natural or aesthetic components of West Yellowstone such as clean air and water, controlled litter, the amount of wildlife present, and the quality of the natural environment. In fact, all but six of the 24 characteristics had a mean importance value greater than 4.00. This is not uncommon, as other research efforts have found similar results (Andereck & Nyaupane, 2011; Frauman & Banks, 2011; Nickerson et al., 2018). Furthermore, as the busiest gateway community to arguably the most famous national park in the world one would expect that residents of West Yellowstone would report a high importance concerning the natural elements of their community.

Ironically (given the purpose of this research), the least important characteristic to residents was public transportation with a mean of 2.90. The opportunities for experiencing not only the Park, but the surrounding rivers, national forests, lakes, wildlife, and wilderness areas

produce no shortage of possible outdoor experiences all within a short drive for residents. Hence, residents of West Yellowstone scored characteristics associated with more modern or urban city settings (such as the availability of hotels, public transportation, or opportunities to experience a variety of entertainment and special events) as relatively unimportant. Residents also placed relatively little importance on the availability of hotels within their community ($x = 3.06$). The four other QOL characteristics that produced a mean importance value of less than 4.00 were 'Variety of entertainment and special events', 'Availability of parking', 'Infrastructure for bicyclists and pedestrians', and 'Awareness of local culture'. This is not to say that residents found these characteristics to be unimportant; rather, they found them to be less important relative to other characteristics.

The importance scores on their own, however, tell only part of the story. Combining the importance score with the satisfaction score to create the QOL score surfaces the relation between the two constructs, therefore conveying the contribution the characteristics make towards the individual's QOL. After creating the QOL score, it is evident that residents perceive the majority of the QOL characteristics are performing adequately relative to their importance, therefore producing results that residents are neither unsatisfied nor completely satisfied (i.e. a mean QOL value near 10). Quality of life mean values indicate that, much like the importance analysis, characteristics of the natural world (e.g., clean air and water, opportunities of outdoor recreation, quality of the natural environment) contribute the most to a positive assessment of QOL for residents of West Yellowstone.

The characteristics of West Yellowstone that detract the most from a positive QOL should be of some concern to residents, but more than likely already confirm what is common knowledge among residents. Much like the open-ended comment results in Chapter 4, the lack of

affordable housing for average income residents is the characteristic that is performing the worst in West Yellowstone, with a performance mean of 2.16 and a QOL mean of 6.15. With the recent surge of services like AirBnB and VRBO, in addition to increased visitation to YNP over the past decade, the purchasing of a home in the vicinity of a highly visited national park is increasingly becoming a lucrative investment option in addition to already serving as a desired location for owning a second home (Nickerson et al., 2018).

Compounding this issue is the unfortunate reality that accompanies the economic side of tourism, where many of the jobs the industry offers are relatively "low skilled", low paying, and seasonal by nature. This combination does not provide enough residents with the necessary equity or income to afford property or real estate. This sentiment was echoed by residents of West Yellowstone who reported the third lowest QOL score for the characteristic of 'Enough good jobs for residents' with a performance mean of 2.88 and a QOL mean of 9.39. In fact, 'Enough good jobs for residents' was a top 10 characteristic in regard to importance for residents, yet produced the second lowest performance score of all characteristics. As a community that is completely reliant on tourism, finding a way to increase the economic growth of tourism while also increasing wages and housing availability will more than likely be the greatest challenge facing West Yellowstone for years to come. As emerging issues in tourism like COVID-19 cause worldwide travel restrictions, places like West Yellowstone that are reliant in part on international visitation will face immense difficulties in providing local safety nets for residents even beyond what was already possible.

Overall, residents of West Yellowstone perceived both positive and negative benefits from the characteristics that are contributing to their QOL. Residents were in general agreement over the positive contributions several different environmental characteristics provided to their

individual QOL. Conversely, the characteristics that detract from their QOL were the lack of affordable housing, lack of control over traffic flow, and the lack of good jobs for residents. For all involved stakeholder groups (town managers, business owners, employees, retired residents, etc.), these findings should provide some insight in to the characteristics that are important to residents (Clean air, Clean water, Quality of the natural environment, Prevention of crime and vandalism, and Opportunities for outdoor recreation), along with insight into how well residents see each characteristic performing in order to make decisions on which characteristics should be protected (see above) and which should be addressed (affordable housing for average income residents, traffic flow, enough good jobs for residents, and controlled traffic).

Research Question Two:

How does the hypothetical implementation of a voluntary shuttle system originating in West Yellowstone affect residents' perceptions of their future quality of life?

Research question two was the primary goal of the project. As mentioned in the literature review, little research has been published concerning the perceived impacts on QOL as the result of ATS for residents of the neighboring gateway community *prior* to the shuttle's implementation. Although other research efforts have examined the impact of ATS *after* its implementation, those research efforts have been more narrowly defined and tend to focus more on other stakeholder groups like business owners, employees, or visitors to that specific community rather than residents themselves. In order to understand residents' perceptions towards a proposed ATS in West Yellowstone, it was necessary to ask residents to evaluate the previously mentioned 24 QOL characteristics as if a shuttle system for visitors was implemented. The recoded values of these perceptions were used as a multiplier or shuttle effect (SE) in conjunction with the original QOL score to help illustrate the positive or negative assessment

residents made of the ATS as it relates to their QOL (Andereck & Nyaupane, 2011; Brown et al., 1998). As Chapter 4 illustrated, residents have both positive and negative perceptions of how the proposed shuttle might affect their QOL.

First, residents perceived that a shuttle would produce a statistically significant difference in the change of QOL (i.e. PQOL – QOL $\neq 0$) for ten characteristics of their community. Of those ten characteristics, eight displayed positively perceived significant differences: Clean air ($z = 2.297$, $p<.05$), Clean water ($z = 2.902$, $p<.005$), Quality of the natural environment ($z = 3.331$, $p<.005$), Amount of wildlife ($z = 3.603$, $p<.005$), Controlled traffic ($z = 4.624$, $p<.005$), Controlled litter ($z = 3.160$, $p<.005$), Public transportation ($z = 4.594$, $p<.005$), and Traffic flow ($z = 4.318$, $p<.005$).These findings echo similar results in the ATS literature that demonstrate the implementation of a shuttle system can improve environmental aspects of a park for both visitors and business owners in the local community (Mace, 2014; Marquit & Mace, 2015). These results make sense in that the goals of ATS in the NPS are to reduce air pollution, help reduce wildlife and auto collisions, and minimize resource impacts where traffic volumes on existing roadways have reached or are at capacity (National Park Service, 2018; Pildes et al., 2019).

Second, residents perceived that a shuttle would have a negatively perceived significant difference on two QOL characteristics: Availability of hotels ($z = -3.004$, $p<.005$) and Affordable housing for average income residents ($z = -6.095$, $p<.005$). Although these were the only two characteristics to show statistically significant results indicating a perceived negative change, other results from the survey (e.g., the write in comment section) indicate there appears to be a concern over the negative impact a shuttle system would have on the aspects of West Yellowstone's economy. When considering the negative potential economic impacts a shuttle may have, it is also important to keep in mind West Yellowstone's history with the regulatory

measures concerning transportation into the park. As recently as 2002 West Yellowstone's winter economy was dramatically impacted by the restrictions placed on the number of snowcoaches and snowmobiles allowed to enter the park. It makes sense that, in a town where residents have lived for an average of 18 years, there would be skepticism around the idea that another NPS intervention specifically related to transportation (especially in the peak summer season) might negatively impact the economic wellbeing of residents.

Third, residents perceived that a shuttle would have no statistically significant impact (i.e. p-value> .05) on the remaining 14 QOL characteristics. These perceptions encompassed a wide range of characteristics in the community such as: 'Variety of entertainment and special events' ($z = .642$, $p>.05$), 'Opportunities for outdoor recreation' ($z = -.016$, $p>.05$) , Quality of roads' ($z = .414$, $p>.05$), "Stores and restaurants owned by local residents' ($z = -.098$, $p>.05$), and the 'Prevention of crime and vandalism' ($z = -.640$, $p>.05$). One of the more surprising findings of this study was the perception that a shuttle would have little to no impact on the 'Amount of noise heard' ($z = .573$, $p>.05$). As mentioned in the literature review, one of the goals of ATS are to reduce noise pollution and improve soundscapes in areas of operation by reducing the number of vehicles on congested roadways. Other research efforts have found that upon a shuttle's implementation, one characteristic that can be improved is the amount of noise heard (Mace, 2014; Marquit and Mace, 2015; Roof et al., 2014). It could be the case that residents are under the impression that a shuttle (particularly one with a parking lot that originates in West Yellowstone) would have little to no impact on the number of cars or people that are present in town, thus providing little to no change in the amount of noise heard by residents. If there is no reduction in number of cars in town, it is entirely possible that the amount of noise reduction that would take place would happen within the West Yellowstone to Old Faithful road corridor, and

not in the town of West Yellowstone itself, thus providing little to no benefit towards residents' QOL.

As a community that finds itself surrounded by U.S. Forest Service and NPS land, one of the main problems currently driving the affordable housing issue in West Yellowstone is the reality that there is a limited amount of land available at any one time to purchase, let alone build on. Perhaps residents perceive that using what available land there is (i.e., the recently acquired 80 acres from the U.S. National Forest Service) to develop a parking or terminal area for a shuttle system into the Park would further compound the housing issues present in West Yellowstone. This perception appeared in the write-in comments, where some residents expressed that parking and congestion issues that originate in the Park should be managed within the park and not in the town of West Yellowstone. This sentiment also appeared when residents were asked where they felt a shuttle parking lot should originate, with 54% (n=82) either disagreeing or strongly disagreeing that a shuttle should originate in West Yellowstone compared to 40% (n=62) who disagreed or strongly disagreed that a shuttle should originate within the YNP boundary.

The proposed shuttle appeared to improve characteristics that already exhibit high QOL scores (e.g. clean air and water, quality of the natural environment, amount of wildlife) while worsening the characteristics with low QOL scores (e.g. affordable housing for average income residents and the availability of hotels). This has the possibility of placing West Yellowstone in a scenario akin to examples found in social exchange theory (Andereck & Vogt, 2005; Perdue, Long, & Allen, 1987; Wang & Pfister, 2008) where residents and town managers have to make exchanges between characteristics-- tradeoffs made in one in order to benefit another (e.g., reducing the amount of undeveloped natural acreage in the community in order to accommodate

more affordable housing for average income residents). As town managers are likely aware, there is unfortunately no easy solution to finding this balance as there will inevitably be winners and losers in any development scenario.

Overall, residents perceived that the proposed shuttle would have a general positive impact on transportation related QOL characteristics. These included positive perceptions of improvement for 'Public Transportation', 'Controlled traffic', and 'Traffic flow' compared to more neutral perceptions of 'The amount of noise heard', 'Quality of roads', and 'Availability of parking'. It seems that residents believe that a shuttle could improve access to public transportation (albeit most likely for visitors), and assist in controlling traffic and traffic flow in town. However, when analyzing these results in conjunction with questions related to residents' attitudes, there is little evidence to support the claim that residents are overwhelmingly in favor of a shuttle system originating in their community. Although these results highlight the potential a shuttle may have for reducing traffic related issues in West Yellowstone, there is a sentiment from residents that it should not be their responsibility to shoulder the burden of easing traffic and parking concerns that originate within the Park itself.

Research Question Three:
To what degree do residents' relationship to the tourism industry predict their perceptions of how a shuttle would impact their future QOL?

Residents' relationship to the tourism industry were significantly related to two QOL factors. Although different predictor or independent variables produced different correlations to the projected change in QOL factors, they nonetheless help explain some of the residents' perceptions. As the degree to which residents felt they personally benefitted from tourism increased, so did the average increase (positive belief) in the change of QOL for community preservation and economic factors. It is possible that those who reported they personally benefit

more from tourism in West Yellowstone perceive the shuttle as an opportunity to the economic viability of the community because they associate the shuttle with increased visitation to the area. However, as the number of years in which a resident had lived in West Yellowstone increased, so did the average decrease (negative belief) in the perceived change of QOL for community preservation and economic factors. It is possible residents believe that if this regulatory measure were to be implemented, it could adversely affect the potential for shuttle businesses in West Yellowstone to operate their own businesses much like the reduction in winter access has hamstrung West Yellowstone's year-round economy.

Residents who had children in the West Yellowstone public school system perceived a greater negative change in QOL for the affordable housing factor than residents who did not. It could be the case that those with children in the school system see the shuttle as a form of tourism development that limits the town's ability to create more affordable housing in what is an already landlocked community. Additionally, how long a resident had lived in the community also had a similar effect on the perceived change in QOL for the affordable housing factor. This finding could stem from the fact that residents who have lived in West Yellowstone longer are more familiar with the housing and land availability issues currently plaguing the community and perceive the shuttle as a threat to creating more opportunities for affordable housing. As mentioned in the methods section, results with respect to the affordable housing factor should be interpreted with caution, however, as they do not possess the statistical reliability of the other two factors.

After residents were asked to give their perceptions of how a shuttle system would affect their QOL, they were then asked questions specific to tourism and tourism development within their community. Overall, residents held a generally negative attitude or opinion towards tourism

development and the potential efficacy of a shuttle system within their community. Five of the eight attitude questions specifically related to a shuttle system held a mean of less than 3.00 on a 5-point scale with (1 being strongly disagree and 5 being strongly agree). Residents felt that a shuttle bus system would not increase parking availability in town ($\bar{x}$ = 2.37, s.d. = 1.361) nor did they feel a shuttle bus system from West Yellowstone to Old Faithful would help reduce traffic congestion in town ($\bar{x}$ = 2.85, s.d. = 1.41). Many of the traffic issues that occur in West Yellowstone tend to be the result of a bottleneck effect that occurs at the West Entrance, where the number of vehicles that are attempting to enter simply overwhelm the present infrastructure, which can lead to a spillover of traffic at the Yellowstone Ave.-Canyon St. intersection. Residents' perceptions of their willingness to support parking infrastructure development within the town of West Yellowstone were closer to the scale midpoint ($\bar{x}$ = 2.94, s.d. = 1.543).

These questions raise an important distinction between the two different scenarios under examination as they relate to the shuttle's possible origin. If a shuttle system were to originate in West Yellowstone, which is something residents exhibited a negative attitude towards (x = 2.57, s.d. = 1.521), then it is possible that traffic issues in town could be mitigated while parking issues would be simultaneously worsened. Building a parking terminal in West Yellowstone would require several acres to accommodate the number of vehicles to remove cars from both off the roadway within the Park as well as their accommodation within town. According to the University of Tennessee's Institute of Agriculture, an area of 180 feet by 242 feet (approximately 1 acre or 43,560 ft.) can accommodate 150 total parking spaces with 10' x 18' spaces and 162 parking spaces with a 9' x 18' angled space design with one-way traffic (Holland, 2014). If five of the recently acquired 80 acres from the National Forest Service were converted into a parking terminal for Park visitors, it could provide approximately 750-810 parking spaces depending on

design. Without enough parking to accommodate the number of visitors who desire to take the shuttle, there is little incentive for visitors to move their vehicle from its current location (especially if the parking terminal is located within walking distance), thus limiting the parking availability for those who will be making their way to West Yellowstone for future accommodations.

On the other hand, if a shuttle system were to originate within the YNP boundary, which residents were relatively more in favor of ($x = 2.99$, s.d. = 1.533), it is difficult to see how traffic or parking related issues for residents of West Yellowstone would change. As mentioned in the introduction, roughly 42% of visitors enter YNP through the West Entrance (Town of West Yellowstone, 2017). In 2019, roughly 4,500 vehicles entered through the West Entrance per day during the month of July (National Park Service, 2020). If visitors plan to enter the Park through West Yellowstone *and* are interested in taking the shuttle, it will still require them to enter through the West Entrance via a shuttle they've boarded either before or after the West Entrance Gate. If they are to board the shuttle before the West Entrance, that would require the NPS to convert existing land within the park boundary near the entrance to a parking lot that would be able to accommodate the necessary number of visitors who wish to take it. The only other existing location that currently carries the necessary infrastructure to accommodate such a large number of visitors within the western road corridor would most likely be Old Faithful. With that said, it is hard to see how a shuttle that originates within the Park past the West Entrance Gate would benefit the residents of West Yellowstone from a traffic flow and parking perspective, as the number of cars that would enter and or be in West Yellowstone at any one time would see little reduction.

Stakeholder and Management Implications

This study provided an assessment of current QOL, in addition to a perceived future assessment of QOL in West Yellowstone as the result of a shuttle bus system. Results show characteristics that are both contributing to and detracting from QOL in West Yellowstone. In addition, residents perceive that a hypothetical shuttle system would enhance improvements in QOL while also negatively compounding other QOL characteristics. Prior to this research, there was little information available on residents' perceptions of ATS in gateway communities to national parks prior to their implementation, let alone a quantifiable assessment of the residents' perceptions of current and future QOL.

For stakeholders involved in planning and management in West Yellowstone and Yellowstone National Park, this study provides baseline information for how residents currently perceive their QOL, along with their attitudes towards a specific form of tourism development: alternative transportation systems. These stakeholder groups include town managers/government, business owners, residents of West Yellowstone, the local county (Gallatin County), and the National Park Service. Due to the breadth of stakeholders involved and the power dynamics that accompany those relationships, managing transportation into YNP from West Yellowstone has historically been a difficult task (Borrie et al., 2002).

It appears that the impacts to the winter economy as the result of snowmachine regulation continue to leave a sour taste in the mouths of residents of West Yellowstone (Town of West Yellowstone, 2017). As a form of "top-down" regulation imposed by the National Park Service on the town, there is still skepticism over how the implementation of a shuttle system originating in West Yellowstone would produce positive QOL and economic results for residents. Although the shuttle would be voluntary in nature, and is perceived to improve some of the traffic control

and flow issues related to QOL in West Yellowstone, there is tepid support for implementing a shuttle system that would originate in the community. This dissonance is exhibited by the fact that residents perceived a shuttle would improve eight of the 24 QOL characteristics in their community, yet they did not positively agree with a single statement regarding tourism, ATS, or tourism development in their community.

Residents of West Yellowstone have lived in their community an average of 17.91 years (s.d. = 14.81 years), meaning that the average resident was also likely living in West Yellowstone at the time of winter restrictions in 2002. If the NPS is serious about mitigating traffic concerns in both West Yellowstone and the western corridor of the Park it appears they will have to perform a heavy lift in order to gain the appropriate trust required by residents of West Yellowstone to sign on to the idea of a shuttle bus systems that originates in town. From the NPS's perspective, it would be much easier to implement and control a shuttle system that originated within the Park. However, it is hard to see how a shuttle system that originates within the Park would assist in improving traffic control, traffic flow, and parking in West Yellowstone. This places YNP in a particularly difficult spot, where they are essentially faced with a difficult task of assisting in the problem solving for improving QOL in West Yellowstone while tasked with simultaneously improving and maintaining the experience for visitors.

It is possible that a shuttle that originates out of West Yellowstone and runs to a larger existing destination with adequate infrastructure like Old Faithful could both decrease crowding and congestion issues in the park while simultaneously improving the QOL for residents of West Yellowstone. However, it would take a degree of planning and persuasion on the part of the NPS to sell the project to residents, along with the necessary political will of the residents, to pull off such a dramatic change, two scenarios that currently seem unlikely. In addition, changes

currently thrust upon both YNP and West Yellowstone because of the COVID-19 pandemic are likely to change the short-term priorities for both entities, making long-term planning all the more difficult under times of uncertainty.

It would be more beneficial to residents of West Yellowstone to use the available land they have to address the affordable housing issues plaguing the community. Building more housing in West Yellowstone will not serve as a panacea, however. Building costs and construction materials are currently high, available land is at a premium, and the current wages in a town completely dependent on tourism are factors that generally do not lead to higher rates of homeownership. It is more likely that current and future residents (particularly seasonal workers) will have greater opportunities to live in apartments or multi-family duplexes once, and if, more housing is constructed in West Yellowstone. This will likely not take the same form as previous development similar to the single-family home zoning seen in the Madison Addition. As outlined in their housing needs assessment conducted in 2015 and 2001, it is possible that West Yellowstone could also adopt a community land trust which could shoulder the burden of cost in an attempt to place more of its citizens in affordable housing (Human Resource Development Council of District IX, Habitat for Humanity of Gallatin Valley, & Northern Rocky Mountain Economic Development District, 2015).

In summary, these research findings provide stakeholders a better understanding of the current state of QOL in West Yellowstone along with how those current perceptions of QOL may be affected as the result of implementing a shuttle system. Consideration of a shuttle system by either the town of West Yellowstone or the NPS will require a serious degree of transparency and faith between the two parties to develop a modicum of trust. Decision making for both the town of West Yellowstone and Yellowstone National Park should take into consideration these

results to implement strategies for both improving the quality of life for residents of West Yellowstone while also improving the park experience for visitors.

Contributions to Tourism

This study contributes to the depth of tourism research efforts that have been conducted within gateway communities to the national parks. As their main focus, most research efforts related to ATS tend to occur after the fact when the ATS has already been implemented and they fail to give proper voice to the gateway communities affected. This research aimed to address the other half of the symbiotic relationship between gateway communities and visitors to understand residents' current QOL along with their perceptions of how a shuttle system may affect their future QOL. This research aimed to fill a gap in the literature by expanding on the previously mentioned Andereck & Nyaupane (2011) and Brown et al. (1998) frameworks in relation to QOL and tourism's impact on that construct. In a community that has a jaded past with government intervention related to transportation, this study explored which characteristics of the community are likely to be improved, degraded, or unimpaired by the proposed implementation of an ATS.

Future Research

While this study addressed some of the pressing questions surrounding QOL and the effect ATS has on that construct, future research can provide even more clarity to the issues that currently contribute or detract from QOL. Understanding the role trust plays in the relationship between residents of gateway communities and the NPS could contribute greatly to understanding any skepticism that is present between the two parties, particularly if joint measures are to be taken in the future to mitigate issues that affect both parties.

Conducting cross-cultural research could also help improve the holistic understanding of QOL in West Yellowstone. One of the limitations of this study was a language barrier with several potential participants, particularly those who spoke Spanish. Relative to the state of Montana, West Yellowstone has a larger-than-average Hispanic population. Although respondents were not asked about ethnicity or race, it could be useful to understand if there are any differences in QOL across ethnic groups in the community, particularly at different employment levels (i.e., managers vs. employees).

Lastly, future research efforts should aim to capture responses from business owners and employees of West Yellowstone businesses. As a rural community in Western Montana, many of the individuals who call West Yellowstone home do not live within the incorporated town boundary. Reaching out to business owners (albeit not all residents) in addition to their employees could help secure a deeper understanding of QOL, not only in West Yellowstone but also in other gateway communities to the national parks.

References

Ajzen, I. (2001). Nature and Operation of Attitudes. *Annual Review of Psychology*, *52*(1), 27–58. doi: 10.1146/annurev.psych.52.1.27

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Allen, L. R., Hafer, H. R., Long, P. T., & Perdue, R. R. (1993). Rural Residents Attitudes Toward Recreation and Tourism Development. *Journal of Travel Research*, *31*(4), 27–33. doi: 10.1177/004728759303100405

Ament, R., Clevenger, A., Yu, O., & Hardy, A. (2014). Assessment of Road Impacts on Wildlife Populations in US National Parks. In Robert Manning, Steven Lawson, Peter Newman, Jeffrey Hallo, & Christopher Monz (Eds.), *Sustainable Transportation in the National Parks* (pp. 19–28). Lebanon, NH: University Press of New England.

Andereck, K., & Jurowski, C. (2006). Tourism and Quality of Life. In Gayle Jennings & Norma Polovitz Nickerson (Eds.), *Quality Tourism Experiences* (pp. 136–157). Burlington, MA: Elsevier Butterworth-Heinemann.

Andereck, K. L., & Nyaupane, G. P. (2011). Exploring the Nature of Tourism and Quality of Life Perceptions among Residents. *Journal of Travel Research*, *50*(3), 248–260. doi: 10.1177/0047287510362918

Andereck, K. L., Valentine, K. M., Knopf, R. C., & Vogt, C. A. (2005). Residents' perceptions of community tourism impacts. *Annals of Tourism Research*, *32*(4), 1056–1076. doi: 10.1016/j.annals.2005.03.001

Andereck, K. L., & Vogt, C. A. (2000). The Relationship between Residents' Attitudes toward Tourism and Tourism Development Options. *Journal of Travel Research, 39*(1), 27–36. doi: 10.1177/004728750003900104

Borrie, W., Davenport, M., Freimund, W., and Manning, R., "Assessing the Relationship Between Desired Experiences and Support for Management Actions at Yellowstone National Park Using Multiple Methods" (2002). *Society and Conservation Faculty Publications*. 11. https://scholarworks.umt.edu/soccon_pubs/11

Brown, I., Raphael, D., and Renwick, R. (1998). *Quality of Life Profile Item #2.* Toronto, Canada: Quality of Life Research Unit, Center for Health Promotion, University of Toronto.

Bryne, W., & Upchurch, J. (2014). Reducing Congestion at Grand Canyon's South Rim. In Robert Manning, Steven Lawson, Peter Newman, Jeffrey Hallo, & Christopher Monz (Eds.), *Sustainable Transportation in the National Parks* (pp. 144-154). Lebanon, NH: University Press of New England.

Carmichael, B. (2006). Linking Quality Tourism Experiences, Residents' Quality of Life, and Quality Experiences for Tourists. In Gayle Jennings & Norma Polovitz Nickerson (Eds.), *Quality Tourism Experiences* (pp. 115–135). Burlington, MA: Elsevier Butterworth-Heinemann.

Daigle, J. J. (2015). Exploring Future Opportunities and Challenges of Alternative Transportation Practice: A System-wide Transit Inventory Across US National Parks. In Francesco Orsi (Ed.), *Sustainable Transportation in Natural and Protected Areas* (pp. 169–180). Milton Park: Routledge.

Dunning, A. (2015). Helping Gateway Communities Embrace Alternative Transportation. In Frencesco Orsi (Ed.) *Sustainable Transportation in Natural and Protected Areas* (pp. 261–274). New York, NY: Routledge. doi: https://doi.org/10.9774/GLEAF.9781315765396_22

Frauman, E., & Banks, S. (2011). Gateway community resident perceptions of tourism development: Incorporating Importance-Performance Analysis into a Limits of Acceptable Change framework. *Tourism Management*, *32*(1), 128–140. doi: 10.1016/j.tourman.2010.01.013

Gursoy, D., Jurowski, C., & Uysal, M. (2002). Resident Attitudes: A Structural Modeling Approach. *Annals of Tourism Research*, *29*(1), 79–105. doi: 10.1016/s0160-7383(01)00028-7

Haines, A. L. (1997). *The Yellowstone Story: A History of Our First National Park* (Vol. 1 & 2). Niwot, CO: Yellowstone Association for Natural Science, History & Education. Boulder, CO: University Press of Colorado.

Hallo, J., & Manning, R. (2014). Social Carrying Capacity of the Acadia National Park Loop Road. In Robert Manning, Steven Lawson, Peter Newman, Jeffrey Hallo, & Christopher Monz (Eds.), *Sustainable Transportation in the National Parks* (pp. 108–117). Burlington, MA: University Press of New England.

Heberlein, T. A. (2012). *Navigating Environmental Attitudes*. New York: Oxford University Press.

Holland, R. (2014). Institute of Agriculture at the University of Tennessee. Retrieved March 3, 2020, from https://ag.tennessee.edu/cpa/Information Sheets/CPA 222.pdf

Holly, F., Hallo, J., Baldwin, E., & Mainella, F. (2014). Incentives and Disincentives for Day Visitors to Park and Ride at Acadia National Park. In Robert Manning, Steven Lawson, Peter Newman, Jeffrey Hallo, & Christopher Monz (Eds.), *Sustainable Transportation in the National Parks* (pp. 165–177). Burlington, MA: University Press of New England.

Howe, J. W., McMahon, E. R., & Propst, L. (1997). *Balancing Nature and Commerce in Gateway Communities*. Washington D.C.: Island Press.

Human Resource Development Council of District IX, Habitat for Humanity of Gallatin Valley, & Northern Rocky Mountain Economic Development District. (2015). *Workforce Housing Needs Assessment and Housing Plan for the Town of West Yellowstone, Montana*. Human Resource Development Council of District IX. Retrieved from http://www.townofwestyellowstone.com/wp-content/uploads/2015/10/Housing-Needs-Assessment-No-Demographics.pdf

Kim, K., Uysal, M., & Sirgy, M. J. (2013). How does tourism in a community impact the quality of life of community residents? *Tourism Management, 36*, 527–540. doi: 10.1016/j.tourman.2012.09.005

Kim, J.-O., & Mueller, C. W. (1991). *Introduction to factor analysis: what it is how to do it*. Beverly Hills: Sage.

Lankford, S. V. (1994). Attitudes and Perceptions Toward Tourism and Rural Regional Development. *Journal of Travel Research*, *32*(3), 35–43. doi: 10.1177/004728759403200306

Lankford, S. V., & Howard, D. R. (1994). Developing a Tourism Impact Attitude Scale. *Annals of Tourism Research*, *21*(1), 121–139. doi: 10.1016/0160-7383(94)90008-6

Lawson, S., Chamberlain, R., Choi, J., Swanson, B., Kiser, B., Newman, P., Monz, C., Pettebone, D., Gamble, L. (2014). Modeling the Effects of Shuttle Bus Service on Transportation System Performance and the Visitor Experience in Rocky Mountain National Park. In Robert Manning, Steven Lawson, Peter Newman, Jeffrey Hallo, & Christopher Monz (Eds.), *Sustainable Transportation in the National Parks* (pp. 118–133). Burlington, MA: University Press of New England.

Mace, B. L., Marquit, J. D., & Bates, S. C. (2013). Visitor Assessment of the Mandatory Alternative Transportation System at Zion National Park. *Environmental Management*, *52*(5), 1271–1285. doi: 10.1007/s00267-013-0164-z

Mace, B. (2014). Restoring Tranquility in Zion Canyon. In Robert Manning, Steven Lawson, Peter Newman, Jeffrey Hallo, & Christopher Monz (Eds.), *Sustainable Transportation in the National Parks* (pp. 258–269). Burlington, MA: University Press of New England.

Martilla, J. A., & James, J. C. (1977). Importance-Performance Analysis. *Journal of Marketing*, *41*(1), 77–79. doi: 10.1177/002224297704100112

Manning, R., Lawson, S., Newman, P., Hallo, J., & Monz, C. (2014). Transportation, National Parks, and Outdoor Recreation. In Robert Manning, Steven Lawson, Peter Newman, Jeffrey Hallo, & Christopher Monz (Eds.), *Sustainable Transportation in the National Parks* (pp. 3–17). Burlington, MA: University Press of New England.

Marquit, J. D., & Mace, B. L. (2015). Park visitor and gateway community perceptions of mandatory shuttle buses. In Francesco Orsi (Ed.), *Sustainable Transportation in Natural and Protected Areas* (pp. 70–81). New York, NY: Routledge.

McCool, S. F., & Martin, S. R. (1994). Community Attachment and Attitudes Toward Tourism Development. *Journal of Travel Research*, *32*(3), 29–34. doi: 10.1177/004728759403200305

National Park Service. (2018, April 4). Alternative Transportation Program. Retrieved March 4, 2020, from https://www.nps.gov/orgs/1548/multimodal-transportation.htm

National Park Service. (2020). Visitation Numbers (U.S. National Park Service). Retrieved March 3, 2020, from https://www.nps.gov/aboutus/visitation-numbers.htm.

Nickerson, N.P.; Bermingham, C; and Berry, M. (2018) "Gardiner, Montana: Resident Perceptions Before and After Development". University of Montana, *Institute for Tourism and Recreation Research Publications*. 374. https://scholarworks.umt.edu/itrr_pubs/374

Ott, L., & Longnecker, M. (2016). *An Introduction to Statistical Methods and Data Analysis* (7th ed.). Boston, MA: Cengage Learning.

Perdue, R. R., Long, P. T., & Allen, L. (1987). Rural Resident Tourism Perceptions and Attitudes. *Annals of Tourism Research*, *14*(3), 420–429. doi: 10.1016/0160-7383(87)90112-5

Perdue, R. R., Long, P. T., & Allen, L. (1990). Resident Support for Tourism Development. *Annals of Tourism Research*, *17* (4), 586-599. doi: 10.1016/0160-7383(87)90112-5

Pildes, R., Baas, J., Daddio, D., McNally, A., Berthuame, A., & Glynn, R. (2019) NPS National Transit Inventory and Performance Report, 2018, NPS National Transit Inventory and Performance Report, 2018. Washington, DC: U.S. Department of Transportation.

Pham, K., Andereck, K., & Vogt, C., (2019). Local residents' perceptions about tourism development. *Travel and Tourism Research Association: Advancing Tourism Research Globally*. 74. https://scholarworks.umass.edu/ttra/2019/research_papers/74

Renwick, R., Brown, I. (1996). The center for health promotion's conceptual approach to quality if life: being, belonging, and becoming. In Renwick, R., Brown, I., Nagler, M. (Eds.) Quality of Life in Health Promotion and Rehabilitation. Sage, Thousand Oaks, CA, p. 75-88.

Roof, C., Kim, B., Flemming, G., Burstein, J., Lee, C., (2014). Noise and Air Quality Implications of Alternative Transportation Systems at Zion and Acadia National Parks. In Robert Manning, Steven Lawson, Peter Newman, Jeffrey Hallo, & Christopher Monz (Eds.), *Sustainable Transportation in the National Parks* (pp. 35–41). Burlington, MA: University Press of New England.

Schalock, R. L. (2000). Three Decades of Quality of Life. *Focus on Autism and Other Developmental Disabilities*, *15*(2), 116–127. doi: 10.1177/108835760001500207

Shea, P. (2009). *Images of America: West Yellowstone*. Charleston, SC: Arcadia Pub.

Shiftan, Y., Vary, D., & Geyer, D. (2006). Demand for park shuttle services—a stated-preference approach. *Journal of Transport Geography*, *14*(1), 52–59. doi: 10.1016/j.jtrangeo.2004.12.005

Stanford, D. (2015). Reducing Visitor Car Use While Securing Economic Benefits in Protected Areas: Application of a Market Segmentation Approach in Lake District National Park (UK). In Francesco Orsi (Ed.), *Sustainable Transportation in Natural and Protected Areas* (pp. 127–139). Milton Park: Routledge.

Szalai, A., & Andrews, F. M. (1980). *The quality of life: comparative studies*. London: Sage. (pp. 8).

Taff, D., Newman, P., Pettebone, D., White, D. D., Lawson, S. R., Monz, C., & Vagias, W. M. (2013). Dimensions of alternative transportation experience in Yosemite and Rocky Mountain National Parks. *Journal of Transport Geography*, *30*, 37–46. doi: 10.1016/j.jtrangeo.2013.02.010

Thomas, C. C., Koontz, L., & Cornachione, E. (2018). 2017 National Park Visitor Spending Effects: Economic Contributions to Local Communities, States, and the Nation Retrieved April 17, 2019, from https://www.nps.gov/nature/customcf/NPS_Data_Visualization/docs/NPS_2017_Visitor_Spending_Effects.pdf.

Tooman, L. A. (1997). Tourism and Development. *Journal of Travel Research*, *35*(3), 33–40. doi: 10.1177/004728759703500305

Town of West Yellowstone. (2017, October 17). West Yellowstone, MT Growth Policy Update. Retrieved January 6, 2020, from https://www.townofwestyellowstone.com/wp-content/uploads/2017/10/TC-Packet-10.17.17.pdf.

Vaske, Jerry J., & Donnelly, Maureen P. (1999). A Value-Attitude-Behavior Model Predicting Wildland Preservation Voting Intentions. *Society & Natural Resources*, *12*(6), 523–537. doi: 10.1080/089419299279425

Wang, Y. A., & Pfister, R. E. (2008). Residents Attitudes Toward Tourism and Perceived Personal Benefits in a Rural Community. *Journal of Travel Research*, *47*(1), 84–93. doi: 10.1177/0047287507312402

Whittlesey, L. H., & Watry, E. A. (2008). *Images of America: Yellowstone National Park.*

Charleston, SC: Arcadia Publishing.

Yellowstone Historic Center. (2019a). From a Confused Identity to Incorporation. Retrieved from https://www.yellowstonehistoriccenter.org/confused-identity/.

Yellowstone Historic Center. (2019b). The First Automobiles in West Yellowstone. Retrieved from https://www.yellowstonehistoriccenter.org/cars-buses/.

Yellowstone Historic Center. (2019c). The Town Grows and Changes. Retrieved from https://www.yellowstonehistoriccenter.org/town-grows/.

Yellowstone Historic Center. (2019d). Winter in West Yellowstone. Retrieved from https://www.yellowstonehistoriccenter.org/winter-travel/.

U.S. Census Bureau. (2010, October 5). Community Facts: West Yellowstone town, Montana. Retrieved March 3, 2020, from https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml?src=bkmk

U.S. Department of the Interior. (2017). *Federal Lands Transportation Program Fact Sheet: NPS Transportation System Characteristics*. *Federal Lands Transportation Program Fact Sheet: NPS Transportation System Characteristics*. National Park Service.

Appendix A: Survey Instrument

West Yellowstone Community Survey

Hello, my name is Carter Bermingham. I'm a graduate student in the W.A. Franke College of Forestry & Conservation at the University of Montana. I am conducting a study to understand how you, as a resident of West Yellowstone, view your quality of life and how future tourism development may impact you. The results will help residents and community leaders identify areas of satisfaction and concern within West Yellowstone. The study is completely anonymous. Your name is never known. Additionally, the National Park Service is in no way affiliated with this research project. If you have questions, please contact me at carter.bermingham@umontana.edu or (406)-207-6728. Thank you for your assistance in this important study.

Please circle the importance level for each item on the left side and then circle your satisfaction with each item on the right side for the following characteristics in West Yellowstone during the peak summer season.

	1. How IMPORTANT are the following characteristics to you?					**2. How SATISFIED are you with the following characteristics of West Yellowstone?**				
	Not at all important				Extremely important	Not at all satisfied				Extremely satisfied
Summer Season Characteristics										
Clean air	1	2	3	4	5	1	2	3	4	5
Clean water	1	2	3	4	5	1	2	3	4	5
Amount of wildlife	1	2	3	4	5	1	2	3	4	5
Preserving undeveloped natural areas	1	2	3	4	5	1	2	3	4	5
Controlled litter	1	2	3	4	5	1	2	3	4	5
Quality of the natural environment	1	2	3	4	5	1	2	3	4	5
Controlled traffic	1	2	3	4	5	1	2	3	4	5
Public transportation	1	2	3	4	5	1	2	3	4	5
Amount of noise heard	1	2	3	4	5	1	2	3	4	5
Traffic flow	1	2	3	4	5	1	2	3	4	5
Availability of parking	1	2	3	4	5	1	2	3	4	5
Quality of roads	1	2	3	4	5	1	2	3	4	5
Infrastructure for bicyclists and pedestrians	1	2	3	4	5	1	2	3	4	5
Availability of hotels	1	2	3	4	5	1	2	3	4	5
Stores and restaurants owned by local residents	1	2	3	4	5	1	2	3	4	5
Prevention of crime and vandalism	1	2	3	4	5	1	2	3	4	5
Variety of entertainment and special events	1	2	3	4	5	1	2	3	4	5
Community pride	1	2	3	4	5	1	2	3	4	5
Opportunities for outdoor recreation	1	2	3	4	5	1	2	3	4	5
Awareness of local culture	1	2	3	4	5	1	2	3	4	5
Affordable housing for average income residents	1	2	3	4	5	1	2	3	4	5
Enough good jobs for residents	1	2	3	4	5	1	2	3	4	5
If a homeowner -The value of my house and/or land	1	2	3	4	5	1	2	3	4	5
Local tax revenue	1	2	3	4	5	1	2	3	4	5

Shuttle Concept

The following is not a formal proposal under consideration by Yellowstone National Park at this time. Recent years have seen increasing congestion at the West Entrance through the geyser basin corridor, and on to Old Faithful. Other national parks have implemented shuttle systems from gateway communities to reduce congestion. A possible scenario that may be considered in the future is to implement voluntary shuttles from West Yellowstone to Old Faithful with multiple shuttles leaving and returning to West Yellowstone each day during peak summer season. At this time, we are interested in your reactions to the general concept of a shuttle, not the details of shuttle stop locations in West Yellowstone.

3. Please circle the number that best corresponds with how you think a shuttle system would impact the current condition in West Yellowstone on the following characteristics during the *peak summer season*.

Summer Season Characteristics	Negatively Impacted		No Impact		Positively Impacted
Clean air	-2	-1	0	1	2
Clean water	-2	-1	0	1	2
Amount of wildlife	-2	-1	0	1	2
Preserving undeveloped natural areas	-2	-1	0	1	2
Controlled litter	-2	-1	0	1	2
Quality of the natural environment	-2	-1	0	1	2
Controlled traffic	-2	-1	0	1	2
Public transportation	-2	-1	0	1	2
Amount of noise heard	-2	-1	0	1	2
Traffic flow	-2	-1	0	1	2
Availability of parking	-2	-1	0	1	2
Quality of roads	-2	-1	0	1	2
Infrastructure for bicyclists and pedestrians	-2	-1	0	1	2
Availability of hotels	-2	-1	0	1	2
Stores and restaurants owned by local residents	-2	-1	0	1	2
Prevention of crime and vandalism	-2	-1	0	1	2
Variety of entertainment and special events	-2	-1	0	1	2
Community pride	-2	-1	0	1	2
Opportunities for outdoor recreation	-2	-1	0	1	2
Awareness of local culture	-2	-1	0	1	2
Affordable housing for average income residents	-2	-1	0	1	2
Enough good jobs for residents	-2	-1	0	1	2
If a homeowner -the value of my house and/or land	-2	-1	0	1	2
Local tax revenue	-2	-1	0	1	2

4. Please describe to what extent you disagree or agree with the following statements...	**Strongly Disagree**				**Strongly Agree**
A shuttle bus system would increase parking availability in town.	1	2	3	4	5
I would support parking infrastructure development in W. Yellowstone for a shuttle bus system.	1	2	3	4	5
My community can handle more tourists.	1	2	3	4	5
A shuttle bus system from W. Yellowstone to Old Faithful would help reduce traffic congestion in town.	1	2	3	4	5
The shuttle bus parking lot should be located within the town of W. Yellowstone.	1	2	3	4	5
A shuttle bus parking lot should be located within the Yellowstone National Park boundary, not in town.	1	2	3	4	5
I would benefit personally from more tourism development in my community.	1	2	3	4	5
Only a small number of residents in W. Yellowstone benefit economically from tourism.	1	2	3	4	5

5. What role does tourism play in West Yellowstone's economy?

No role Slight role Moderate role Large role Dominant role

6. How knowledgeable would you say you are in regard to the tourism industry in West Yellowstone?

Not at all knowledgeable Slightly Moderately Very Extremely knowledgeable

7. How involved do you feel you are with tourism decision making in your community?

Not at all involved Slightly involved Moderately involved Very involved Extremely involved

8. Please describe the amount of contact you have with tourists in your community.

No contact at all Slight contact Moderate contact Large amount of contact Continual contact

9. To what degree do you feel you currently benefit personally from tourism in your community?

No benefit at all Little benefit Moderate benefit A large benefit Extreme benefit

10. How long have you lived in West Yellowstone? _____year(s)

11. **How many months out of the year do you live in West Yellowstone?** _____month(s)

11. Do you have a child in the West Yellowstone public school system? (Check one. If yes, answer the questions that follow)

_____1. Yes

1a. **If yes, number of children in West Yellowstone school system?** _____

1b. **What age (s)?** _____

_____2. No

12. What best describes your current employment status? (**Circle only ONE**)

1. Business owner 2. Manager 3. Employed 4. Unemployed 5. Homemaker 6. Retired

**** If you are a business owner, manager, or employed in West Yellowstone answer the following questions. If not, skip to Q15****

13. What best describes your business and/or place of work: (circle all that apply)

- Accommodations
- Restaurant/Bar
- Guide/Outfitter/Tours/Recreation
- Transportation/Travel
- Arts/Entertainment
- Finance, Insurance, Real Estate
- Retail
- Health Care/Social Services
- Grocery/Convenience
- Gas Station
- Construction/Manufacturing
- Government (fed, state, local)
- Other (please describe)

  _____

14. How many months out of the year is your business and/or place of work in operation? _____

15. What is your age? _____

16. Are you? Male Female Prefer not to Answer

17. Please provide any additional comments about West Yellowstone. Add your own paper if you need more room!

Thank you for your time!