Mobility Mindset of Millennials
in
Small Urban and Rural Areas

Prepared by

Natalie Villwock-Witte, Assistant Research Professor/Research Engineer

Karalyn Clouser, Research Assistant

Small Urban and Rural Livability Center (SURLC)

Western Transportation Institute (WTI)

College of Engineering

Montana State University (MSU)

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

GLOSSARY OF ABBREVIATIONS

APTA	American Public Transportation Association
IMR	Institute of Mobility Research
MSA	Metropolitan Statistical Area
MTA	New York City Metropolitan Transportation Authority
NHTS	National Household Travel Survey
NJT	New Jersey Transit
PATH	New York City Port Authority Trans-Hudson
PIRG	Public Interest Research Group
PPP	Public Private Partnership
TOD	Transit Orientated Development
TRIS	Transportation Research Information Service
UTC	University Transportation Center
VMT	Vehicle Miles Traveled
WTI	Western Transportation Institute

1   INTRODUCTION

1.1   Background

Popular media portrays the Millennial generation in two ways. On the one hand, Millennials are lauded as the generation that can potentially "save us from ourselves," particularly considering their reported interest in alternative and sustainable transportation modes. On the other hand, Millennials are often portrayed as lazy and obsessed with technology. Recent, rigorous studies have begun to consider a broader view of Millennials, and the results seem to paint a different picture, which can be characterized as either good or bad, depending on one's viewpoint.

Millennials, also called Generation Y, are typically described as those born from 1983 to 2000. However, the birth years identified for the Millennial generation vary by source, as discussed by Rive et al. (1). While Table 1 presents age ranges that do not directly overlap with those used for this study (e.g. Millennials would be born between 1978 and 1995 according to Table 1) it provides the reader with an understanding of the size of this generational cohort in the United States (U.S.) population as compared with other generations.

Table 1: 2010 Share of U.S. Population by Generation (2)

Age in 2010 (Years)	Share of U.S. Population (%)	Generation
81+	3.3	Silent Generation
65-80	9.7	Depression and War Babies
46-64	24.6	Baby Boomers
33-45	17.2	Generation X/Gen X
15-32	25.0	Generation Y/Millennials/Gen Y
<15	20.1	Generation Next

As shown in Table 1, 2010 was the first year in which Millennials represented a larger proportion of the population than the Baby Boomer generation. Millennials account for approximately 80 million people in the U.S. (2). The researchers should note that more recently, sources like the Pew Research Center, have defined the Millennials as being born between 18 and 34 in 2015, thereby numbering 75.4 million people in the U.S. (Note: They also identify the generations as, youngest to oldest: Millennials, Gen X, Boomer and Silent. They define the "Silent Generation" as discussed herein as "The Greatest Generation" with the "Depression & War Babies" generation discussed herein as "The Silent Generation." This reference is from April of 2016 (3).)

For this study, generational divisions are defined as follows:

1) Silent Generation: born 1929 and earlier

2) Depression and War Babies: 1930 to 1945

3) Baby Boomers: 1946 to 1964

4) Generation X (Gen X): 1965 to 1982

5) Generation Y/Millennials (Gen Y): 1983 to 2000

6) Generation Z/Generation Next: 2001 to the present.

The beginning and end date of a generation may vary slightly dependent upon the source. Furthermore, characteristics associated with each generation may not be true for every person within a defined generation, as generational cohorts are an average (4). Consequently, there are likely individuals within each generational category, typically those at the beginning or end of a generation, who do not follow all of the characteristics associated with that generation.

At 80 million people, the Millennial generation will have a growing impact on many aspects of society, including current and future transportation needs (5). Research thus far suggests that this generation has significantly different lifestyle trends than previous generations, which has created a need to re-evaluate transportation policy and planning. Some of the notable characteristics attributed to Millennials that reportedly differ from other generations include that they are 1) marrying and starting families later, 2) obtaining higher levels of education, and 3) prefer urbanized areas.

Several recent studies have been conducted in urban areas that specifically focus on transportation preferences and trends of Millennials ((6), (7), (8)). These studies show that Millennials are:
1) Driving less than any previous generation,
2) Most likely to live in urban and walkable neighborhoods, and
3) More open to non-driving forms of transportation.

While the recession may play a part in the new travel behavior of this generation, other factors also have an influence, such as the reduced prevalence of licensed drivers; interest and adoption of other modes of transportation; and a high dependence on mobile, internet-connected technologies (e.g., online shopping, social media). In addition, this generation had a "relative propensity for urban lifestyle components" (i.e. choosing the travel mode that best fits the trip type, heightened environmental awareness) (6) regardless of whether they live in cities or suburbs. Many of these findings support six livability principles that are gaining growing acceptance and use among planning agencies. These principles work together to design and implement transportation, housing, and commercial development that gives people access to affordable and sustainable transportation (9). These six principles include:
1) Provide more transportation choices
2) Expand location and energy efficient housing choices
3) Improve economic competitiveness of neighborhoods
4) Target Federal funding towards existing communities
5) Align Federal policies and funding
6) Enhance the unique characteristics of all communities

While there is now a better understanding of Millennial transportation needs and preferences in urban areas, no studies have been done in rural and small urban areas. Therefore, it has not been established whether the same preferences and viewpoints exist for Millennials living in these communities. Rural and small urban areas have a strong interest in attracting and retaining this generation as residents as doing so is intrinsically tied to their economic well-being.

There are significant demographic, transportation and lifestyle differences between urban areas and small urban/rural areas, including population density, transportation infrastructure, and technology infrastructure (e.g., cell phone reception). Hence, the purpose of this research is to

conduct a study to identify Millennial lifestyle trends and transportation needs in small urban/rural areas, and how they compare to what is available in these locations.

1.2   Project Overview

The primary objective of this project is to understand whether Millennials in small urban and rural communities (small urban ranges from 50,000 to 200,000 people; rural cities and towns have less than 50,000) have the same mobility mindset as those in large cities.

Data was collected from survey respondents living in both urban and rural areas from multiple generations across four states: Minnesota, Montana, Washington and Wisconsin. However, the focus is on Millennials in small urban and rural areas.

The project report is organized as follows:

- Literature Review
- Methodology
- Data Collection
- Results
- Conclusions
- Future Work

2   LITERATURE REVIEW

For this task, the research team conducted an in-depth search and review of literature and other available information pertaining to Millennial transportation needs and preferences. Since many previous studies of the Millennial mobility mindset have focused on urban and suburban areas, the objective of this study was to provide an understanding of small urban and rural considerations. However, given the limited availability of research focused on small urban and rural considerations, this literature review also includes discussion of findings from studies in urban areas.

The research approach employed a comprehensive literature search through sources such as, but not limited to, the Transportation Research Information Service (TRIS), Google Scholar, the Montana State University Library, SCIFinder Scholar, and other databases. The following sections summarize and discuss the literature identified by this effort. With the exception of the section specifically devoted to reviewing international literature, all of the literature discuses findings related to Millennials in the U.S.

This chapter is organized into three sections:
- Section 2.1 discusses how Millennials are portrayed in popular culture via newspaper articles as this is how Millennials tend to be characterized. Only some of these articles clearly identify that they are based on larger reports that summarize studies on Millennials. It is unclear where the others draw their conclusions about Millennials from.
- Section 2.2 presents information found in journal articles and reports. It is subdivided into:
    - International Understanding;
    - Mode Choice;
    - Vehicle Miles Traveled;
    - Behavioral, Economic, and Demographic Factors;
    - Location Choice; and
    - Technology Preferences.
- Section 2.3 presents a model developed by the researchers using 2009 National Household Travel Survey (NHTS) data focusing on rural environments.

2.1   Millennials in Popular Culture

Many aspects of Millennials have been discussed in popular culture. This section summarizes blogs and online articles about Millennials. It seems only fitting that such media are discussed considering that Millennials are known to be technologically savvy (see the last section for further discussion). Some of these articles are based on rigorous research studies. It is of particular interest to note that research study outcomes (discussed in the subsequent section) do not always align with what is presented in popular culture.

The Millennial generation has a much more flexible concept of mobility and takes the time to choose the practical option for each trip. According to an American Public Transportation Association (APTA) study *Millennials and Mobility*, 70% of Millennials use multiple travel options several times or more per week (10). The study identifies many factors like convenience,

saving money, exercise, the ability to socialize online, protecting the environment, and feeling connected to the community as influencing the choice to use public transportation.

It has been suggested that America's love affair with the automobile is slowly waning. Up until 2004, the number of miles driven per licensed driver had increased every year, but then the driving boom started to decline (11). Millennials were found to drive 23% fewer miles on average in 2009 than in 2001 (12). Millennials are more open to alternative forms of transportation. As Danny Katz, Director of the Colorado Public Interest Research Group says, "The driving boom is over" (12). Less than 15% of Millennials would describe themselves as "car enthusiasts," preferring to take advantage of new technology (i.e. upgrading their cell phone) instead of purchasing a new vehicle (12). Yet, in 2015, the FHWA reported that in 2015, vehicle miles traveled surpassed that in 2007 (13).

The automobile is no longer viewed as a rite of passage. Only 31% of 16 year olds and 49% of 17 year olds held a driver's license in 2008 (14). This trend could be due to increasing restrictions and graduated licensing programs, but the trend is also found among 21-30 year olds. The number of automobile miles driven by 21-30 year olds in the U.S. fell 13.7% in 2009, according to the 2009 FHWA National Household Travel Survey (14). These numbers are expected to decline over the next 20-30 years (11). Planners and policy makers may want to focus on public transportation systems in order to meet the demands of the younger generations.

Millennials are increasingly more urban. According to a Nielsen study conducted in 2014, 62% of Millennials prefer to live in "mixed-use" communities that are found in urban areas and 40% say they would like to live in an urban area in the future (15). These communities (also called "new urbanism" communities) offer a mix of housing and businesses, but also transportation options especially bicycling and walking. Many cities like Miami, Memphis, San Antonio, Portland, and Jersey City are adopting these trends in order to attract and retain Millennials (15). Millennials want to live in areas with a sense of community, areas that are authentic. Places like Austin, Texas have a great appeal with its unique art scene and urban convenience. The concentration of Millennials in Austin is 1.2 times higher than the national average (16).

Transportation options may be one reason Millennials flock to urban areas. A Rockefeller Foundation study conducted in conjunction with Transportation for America in 2014 found that 54% of Millennials would be willing to move to a city with better transportation options, and 66% of Millennials place transportation options in their top three concerns when evaluating a place to live (16). When looking for places to live, ads for housing or apartments highlight locations near transit stops (17). In places where public transportation is expanding, so is housing. In Washington, DC, the Metro Green line was completed in 1999. The area around the Green line has seen a 33% growth in population due to 18-24 year olds and more than 5000 multifamily homes that were added to the area in the decade after the Green line was completed (18). James Corless, with Transportation for America, states that walkable neighborhoods with access to many services and public transportation are the "key to economic success of the area" (19).

Bob Poole, with the Reason Foundation, argues that Millennials are not losing interest in the automobile but that this is an effect of the recession (20). Millennials have been hit hard by the economy, and when considering the trends for the previous generation (Generation X) the outlook for Millennials is not very promising. Although 82% of Generation X members are earning more than their parents, many are still in debt from student loans and cannot save to invest in themselves or their children (21). Carrying this debt has an effect on choices to get married and start a family,

buying a house, and saving for retirement. As Millennials take on even more debt to obtain a higher level of education, similar economic woes are expected to persist.

Paul Taylor of the National Automobile Dealers Association also blames the economy for the decrease in driving and licensing. According to a 2010 Pew Research Center report, 37% of young adults were out of work or underemployed (20). (Note: Underemployed is not being able to find a job that fits the level of education or skill-set that one has.) Employment status affects young adults in many ways: more and more young adults are living with their parents or with multiple roommates, have not bought a house, and are delaying starting a family. Sixty-six percent of Millennials are renters, and are living with roommates or family (15). Unemployment has led younger consumers to drive less. It is believed by Paul Taylor that as the economy picks up that some automobile trends will reverse. According to APTA, 46% of transit users say that saving money is the main reason they use transit (22). Some transit users reported having saved in excess of $9,000 per year (23). The U.S. Volpe Center looked at reductions in driving as compared with the increases in transit use, and transit use only accounts for about 1% of the decrease in automobile travel. Bicycling and walking only account for a few percent more of this decrease (20). It is believed that when many Millennials start to enter the workforce they will want the freedom of owning a personal vehicle.

Is technology to blame for the decline of the automobile? The Millennial generation has taken to the smartphone with full force. APTA anticipates that future features of transit will include things like smartphone charging stations, fare collection via smartphone, WiFi and 4G/3G access, and improved pedestrian access to transit (10). 40% of Millennials state that being able to multitask on public transit is the reason they favor it (23).

As technology has advanced, so has the workforce. The internet and mobile phones have made telecommuting increasingly common, reducing work related trips as commuting is no longer necessary. Many companies are looking to telecommuting to attract and retain employees. A 2008 survey by Cisco Systems found that telecommuting gives employees a significant increase in work-life flexibility, and they have an overall increase in job satisfaction and productivity. At Cisco the average employee telecommutes two times per week (24), and 69% of respondents cited higher productivity while working remotely and did not suffer from communication issues (24). 80% of respondents stated they had an improved quality of live thanks to telecommuting (24). In addition to the positive effects on the employee, telecommuting also helps many companies to reduce costs and lower carbon emissions. In a 2009 study, Cisco employees reported an annual fuel savings of $10.3 million due to telecommuting (24). However, in 2010, Paul Taylor with the National Automobile Dealers Association stated that while telecommuting is growing, it is not growing as fast as predicted (14).

A variety of factors have led Millennials to drive less: economic hardship, environmental concerns, and an increasing preference to remain connected to the internet. The question remains whether these trends will hold steady or if transportation needs will continue to change. APTA President and CEO Michael Melaniphy believes that "this generation wants the pragmatic benefits of having multiple ways to get around. The solution is investment in a long-term transportation bill that includes strong investments in a variety of modes including public transportation" (10).

2.2   Reports and Journal Articles on Millennials

This section focuses on research findings drawn from journal articles and reports.

2.2.1 International Understanding

In industrialized countries (i.e. the United Kingdom, Sweden, Norway, South Korea, Japan, and Australia), there has been a decrease in Millennials who obtain a driver's license, own a car, and in vehicle miles traveled (25). These findings were documented in studies from individual countries, as well as multi-country studies.

2.2.1.1 Findings Across Industrialized Nations

In 2013, the Institute of Mobility Research (IMR) in Munich, Germany conducted a study of the mobility choices of Millennials in Germany, France, Great Britain, Norway, Japan, and the United States (7). This study looked at data on licensing, car availability, and travel distances in each of the study countries. In addition, the countries of Germany and Great Britain were used as case studies.

Basic data trends found that license-holding has decreased among Millennials in Great Britain, the U.S., and Japan. For Great Britain and the U.S., these changes could reflect the increase in difficulty of obtaining a license. License-holding has stagnated in general among all of the study countries. The average annual distance traveled by personal vehicle has decreased in Germany, France, Great Britain, Norway, Japan, and the United States. Lower automobile use was more pronounced among men than women.

There are many possible reasons for these changes in mobility. There are a number of overall changing socio-economic factors, such as an:

- Increase in the number of young adults receiving a higher level of education,
- Increase in the number of young adults delaying their entry into the full-time workforce,
- Increase in the number of young adults who delay starting a family, and
- Increasingly urban population.

All of these changes contribute to young adults who are less likely to own or use a personal vehicle (7). More transportation policies are aimed at shifting transportation from personal vehicle use and encouraging alternative transportation in urban areas. Recently the increase of smart phone and other mobile device usage has had an impact on travel choice, as most Millennials wish to remain connected to the internet while traveling. The following subsections discuss the findings of the case studies.

Germany Case Study

As shown in Table 2, Millennials make up 20% of the German population (7). As discussed in the Introduction, this is less than the percentage found in the U.S., and the total number of Millennials is less than one quarter of that in the U.S. IMR conducted an analysis of people between the ages

of 18-34 by using data ranging from 1997 to 1999 to obtain a representation of 1998, and data ranging from 2007 to 2009 to obtain a representation of 2008 (i.e. comparing Generation X when they were between the ages of 18 to 34 to the Millennial generation when they were between the ages of 18 to 34). As the analysis used by IMR took data at an aggregated level, it is difficult to comment on how modifications to the transit system (e.g., increased service and accessibility) may or may not have contributed to the findings. Important changes in this age group include a doubling of mileage traveled by public transportation and an overall increase in alternative transportation (e.g. bicycling, walking) usage. Table 2 compares the trends of young adults in Germany at these two points in time.

Table 2: Overview of relevant recent trends among young adults and their mobility in Germany (7)

Statistic	1998	2008	Relative change
Persons aged 18 to 34			
Number of persons	19.0 million	16.5 million	↓ -13%
Percentage of the German population	23%	20%	↓ -13%
Young households (no person older than 34)			
Number of young households	7.1 million	6.3 million	↓ -11%
Percentage of young households among all households	19%	16%	↓ -16%
Cars			
Cars registered to 18- to 34- year olds	9.7 million	5.4 million	↓ -44%
Cars in use by young households	6.8 million	5.6 million	↓ -17%
Young households by car ownership			
No car	20%	28%	↑ +39%
One car	63%	55%	↓ -13%
Two or more cars	16%	17%	↑ +3%
Weekly per-capita distance travelled by 18- to 34-year olds, by mode			
Car	287 km (178 mi)	220 km (140 mi)	↓ -23%
Public transport	52 km (32 mi)	100 km (60 mi)	↑ +92%
Non-motorized modes	12 km (7.5 mi)	16 km (9.9 mi)	↑ +33%

Much like the trends found in the multi-country study of Millennials, transportation choice factors that may have contributed to the decrease in car ownership in Germany include: 1) an increase in individuals with a higher level of education, 2) a delay in entering the full time workforce, and 3) a delay in starting a family. Young adults in Germany saw a decrease in miles traveled commuting to work (fell from 105 km (65.2 mi) per week in 1999 to 97 km (60.3 mi) per week in 2007) (7). In particular, the decrease in vehicle miles traveled can be explained by Millennials becoming much more multi-modal near the end of the 2000s (see increase in public transport and non-motorized modes as compared with decrease in car usage in Table 2).

Case Study – Great Britain

Great Britain has an aging population, and the percentage of young adults has decreased. When comparing Great Britain's representation of persons aged 18 to 34 to that of Germany's, there are fewer young people (13.3 million as compared with 16.5 million); however, they represent a slightly larger percentage of the total population (22% as compared with 20%). The percentage is more comparable to that in the U.S., although the actual number of Millennials in Great Britain is just under 17% the number of Millennials in the U.S. IMR conducted an analysis for Great Britain similar to that for Germany. Table 3 compares the trends of young adults in Great Britain at these two points in time (i.e. comparing Generation X with the Millennial generation).

Table 3: Overview of relevant recent trends among young adults and their mobility in Great Britain (7)

Statistic	1998	2008	Relative change
Persons aged 18 to 34			
Number of persons	13.4 million	13.3 million	↓ -1%
Percentage of the British population	24%	22%	↓ -6%
Young households (no person older than 34)			
Number of young households	4.8 million	4.2 million	↓ -12%
Percentage of young households among all households	20%	17%	↓ -16%
Cars			
Cars registered to 18- to 34- year olds	7.6 million	6.7 million	↓ -11%
Cars in use by young households	4.8 million	3.8 million	↓ -21%
Young households by car ownership			
No car	28%	34%	↑ +21%
One car	49%	41%	↓ -17%
Two or more cars	23%	25%	↑ +10%
Weekly per-capita distance travelled by 18- to 34-year olds, by mode			
Car	222 km (138 mi)	171 km (106 mi)	↓ -23%
Public transport	39 km (24 mi)	47 km (29 mi)	↑ +22%
Non-motorized modes	8 km (5 mi)	9 km (6 mi)	↑ +6%

While there has been an increase in the use of alternative transportation, it is not as significant as in Germany (compare Table 3 to Table 2, 92% increase in public transportation use in Germany compared with only a 22% increase in Great Britain; 33% increase in non-motorized use in Germany compared with only a 6% increase in Great Britain). A decrease in the number of miles driven by private car has been especially prominent among the urban population. Changing socio-economic factors have played an important role in mobility in Great Britain. The cost of home ownership and auto insurance has risen dramatically, leading to more young adults living in rentals

or staying home with their parents. All of these factors lead to decreased automobile ownership (7).

The IMR study has shown that Millennials have decreased access to cars and have decreased the mileage driven. These trends are particularly prevalent in urban areas. As highlighted throughout the overall findings and those from the case studies, the reasons for the decrease in automobile usage can be explained by many socio-economic factors such as: 1) urbanization, 2) an increase in the pursuit of higher education, 3) a delay in entering the workforce, 4) a delay in starting a family, and 5) economic factors that affect the living situation (increasing rental costs and staying at home with one's parents). These trends suggest that the Millennial generation will become more multi-modal, but more research will be needed to understand how these socio-economic factors are affecting Millennial mobility.

2.2.1.2 Studies Specific to Germany

A study by Kuhnimhof et al. (26) in 2012 utilized data from three surveys conducted in Germany: one by the German Mobility Panel, and two German Income and Expenditure Surveys (in 1998 and 2008). The first survey is a panel survey. The other two are cross-sectional surveys. The authors expressed some concern over the results of the first survey, because there was only a small sample size of respondents from the focus age group of 18 to 34. The most significant changes in car use are not explained by car ownership or the travel behavior of those without cars. In fact, more households own cars in 2008 as compared with 1998 (20% increase). Behavioral changes of those without cars accounted for only nine percent of the decrease in car use. By contrast, those respondents *with* cars reported significant behavioral changes. They accounted for approximately three-quarters of the changes in kilometer miles driven by cars. There is a strong correlation between car ownership and income. Living in an urban area and a higher level of education were correlated with reduced car ownership. Single-person households were less likely to own cars. They found that while it seems that households with cars use them at least once a week, cars are not the only mode choice. Car trips are exchanged for non-motorized modes for short trips; public transportation modes are preferred for long trips. The authors concluded that young people's preferences for 1) living in an urban area, 2) pursuing more education, and 3) delaying starting a family all contribute to a reduction in the vehicle miles traveled by car. The authors believe that the results indicate that carless neighborhoods or those that encourage car sharing will not be successful in attracting young people; rather, they believe those that provide various transportation mode options will be the most appealing.

2.2.1.3 Studies Specific to Greece

In 2014, Kamargianni and Polydoropoulou (27) published the results from a study in Greece during the 2011-2012 school year to gain insight on high school students' perceptions of walkability. For this case study, researchers surveyed 1,988 high school students aged 12 to 18 (i.e. students were born before or during 2000 thereby falling within the Millennial generation) in various geographic regions in Greece: one rural, one insular (island), and one urban area. The goal was to gain insight on teenagers' views of walkability to school. Eight high schools participated in this study: eight

schools from the greater Athens (urban) area, six schools in the Alexandroupolis (rural) area, and eight schools in the Chios (island) area. Results were distributed among all the areas with 36% of the participants from the urban area, 29% from the rural area, and 35% from the island area. This study is of particular interest because it documents the transportation perspective of the youngest cohort of the Millennial generation and draws from data of those residing in rural areas.

The results of the survey of high school students showed that the main transportation mode was walking, with over 40% of students walking to and from school (27). Distance was the biggest factor in whether or not students would choose to walk to and from school. The maximum distance walked was 1.6 km (0.99 mi) for urban students, 2 km (1.2 mi) for rural students, and 1 km (0.6 mi) for island students. Results also showed that as household income increased, the probability of walking decreased in the island area, whether by driving themselves or being escorted by a parent. Many factors were evaluated to determine their effect on whether or not a student would walk to school including traffic lights at intersections (especially in urban areas), weather (the worse the weather, the bigger the decrease in walking), sidewalks and lighting (particularly important for rural and island students), and the presence of trees and flowers (for urban, rural, and island). Overall safety factors were most significant in determining whether or not a student would walk to and from school. The results also show that female students in general perceived walkability constraints more strongly than male students. The contributions of this study are that it focuses on teenagers (very few studies do) and it compares characteristics of student travel behavior in different land settings.

These results from Kamargianni and Polydoropoulou's study illustrate how teenagers view various characteristics of their neighborhood and the constraints to walkability. The significant walkability constraints were distance and safety factors for all students. Kamargianni and Polydoropoulou recommended implementing infrastructure that will support future active transportation usage, by focusing on sidewalks, bike lanes, and similar features.

2.2.1.4 Studies Specific to New Zealand

Rive et al. (1) performed a study to better understand public transport perspectives of Generation Y in New Zealand. They define Generation Y as those individuals 15 to 35 in 2014 (born between 1979 and 1999). The authors used New Zealand datasets to better understand historical travel behavior; used focus groups to gain an in-depth understanding of drivers, barriers and key life states that impact how one travels; and conducted a qualitative survey of 1,191 travelers. They found that regardless of age, frequency and the area covered by public transportation were identified as the most important service priorities. Millennials were also found to be particularly interested in free transfers and real-time information. Rive et al. (1) also concluded that more focus should be placed on retaining Millennial ridership during key life stage changes like moving and starting a family, as these were found as correlating strongly with abandoning public transportation for a private vehicle.

2.2.2 Mode Choice

Davis et al. (2012) (28) comment on Millennial driving habits by comparing survey responses of 16 to 34 year olds during the 2001 NHTS to 16 to 34 year olds during the 2009 NHTS. They conclude that in 2009, more 16 to 34 year olds:

- Travelled 117 more miles using active transportation (biking, walking and transit),
- Have taken 24% more bike trips,
- Walked to destinations 16% more often, and
- Took public transit 40% more often.

In fact, of the 10 billion passenger mile increase in public transit ridership between 2001 and 2009, more than 60 percent of it can be attributed to the 16 to 34 year old age group. The study argues that the Millennial's transportation habits are long-term regardless of future financial stability of the individual. The authors note that the decrease in miles driven per capita began three years before the recession. Moreover, even Millennials with financial stability (annual household incomes over $70,000 from 2001 to 2009) continue to invest in active transportation modes, increasing their public transit use, biking and walking by 100%, 122% and 37%, respectively.

2.2.3 State-Specific Studies

Studies like *Millennials: A Portrait of Generation Next* (29) and *Transportation and the New Generation – Why Young People are Driving Less and What it Means for Transportation Policy* (28) provide national insight into the changing attitudes towards transportation. While these results are useful to help determine the future of transportation policy, some states, like Ohio, Vermont, and Wisconsin want a more targeted perspective. This section discussions findings from studies in these three states.

The Ohio Public Interest Research Group (PIRG) conducted a study in 2015 by conducting a survey of 10 universities across Ohio to better understand how Millennials view transportation (30). Ohio has a stagnating population growth rate. Ohio PIRG cited the need to attract and retain young adults to sustain a prosperous economy. The Ohio PIRG survey collected a total of 500 responses. The results indicated that 85% of students said it was "very important" or "somewhat important" for them to live in a place *after* graduation where they could get around without driving (30). Many students used public transportation, bicycling, or walking to get to class. Eighty-four percent of students who did not currently use transit said they would be "somewhat likely" or "very likely" to use transit if it was more convenient (30). Reasons that students were not currently using public transportation are shown in Figure 1.
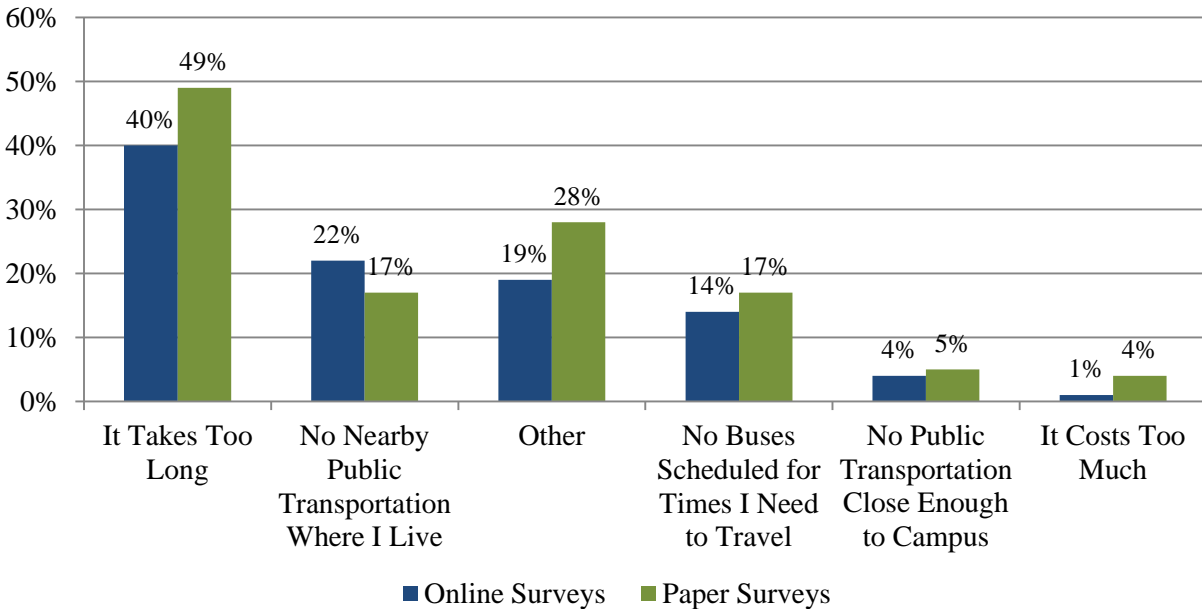
Figure 1: Why Ohio Students Who Drive Do Not Use Public Transportation (30)

It is clear that Millennials want more transportation options. The State of Ohio was ranked 38 of 51 states (including Washington D.C.) in state funding for public transit in 2014. The funding cuts to public transit have limited the number of transit services and caused increased fares. ODOT's *Ohio Statewide Transit Needs Study* calls "for funding in 2015 to repair the existing fleet of public transit vehicles, expand transit options, and meet the public demands for transit that currently remain unmet" (30). The Ohio PIRG recommends that the state look to its universities as a good example of how to handle transit and as a possible partner in providing communities with more transportation options. The universities have provided transit incentives to students including reduced or free fares, expanded bike lanes, and vehicle sharing programs.

The State of Vermont's young adult population has decreased by about 20% between 1990 and 2010 (31). Vermont was rated as the second most rural state according to the 2010 U.S. Census Bureau, with 61.1% of Vermont's population living in rural areas (32). National studies have shown that young adults consider transportation choices when they choose a place to live. The Vermont Transportation Board (Board) is working on policies to attract and retain young adults to the state. The Board conducted eight public forums throughout the state to discuss transportation in Vermont. Two hundred thirty-five college students, faculty, and young professionals participated in these forums.

 Many young adults expressed concerns that owning a car was a necessity, not a choice in Vermont. Young adults desire more transportation options; Vermont could retain this generation if more options became available. These young adults expressed a desire to live in "smart growth" areas with transportation options and a mix of commercial and residential buildings. Many young adults cannot afford the costs associated with a vehicle and the lack of transit options in rural areas was described by some during the forums as "confining." Young adults also describe the lack of transportation options as disappointing: the buses are not convenient enough, do not run late enough in the day to be useful, and there are not enough connections from rural areas to urban

centers. Furthermore, they indicate that it is not just transit that is lacking. Vermont lacks the infrastructure to make bicycling and walking safe, including sidewalks, bike lanes, and lighting. Vermont has car sharing through Carshare Vermont and ZipCar, but only in the Burlington area, so participants at these forums called for expanded services. With rideshare programs like Uber and Lyft on the rise, participants of these programs stated that they find them useful for getting around in urban areas, but expressed safety concerns of using these services in rural areas.

The Board found these results useful in gathering insight into young adults' transportation choices that can be used to create policies to attract and retain young adults in Vermont. The Board began working towards implementing solutions to the issues raised during these forums, including VTrans working with Carshare Vermont to increase the number of vehicles available in the Montpelier area during 2015 (31). The Board is also working with Smart Growth America to develop plans to review Vermont roadway designs to make walking, bicycling, and public transportation safer and more convenient in the future.

In 2014, the Wisconsin PIRG Foundation conducted a survey of 530 college students across Wisconsin to gain insight into their transportation opinions (33). The State of Wisconsin, like Vermont, is asking for input from young people because leadership is concerned that the state is experiencing 'brain drain' – young adults graduating from Wisconsin colleges are not being retained. Though 90% of respondents planned to own a car after graduation, and almost 50% currently commute by car, the results of this survey have shown that Wisconsin's youth are concerned with the availability of transportation options. Sixty percent would consider staying in Wisconsin after graduation if they could live in a place where they could get around without driving. Forty-seven percent want to live in a place after graduation that has options other than driving. In areas with transit options, transit ridership has increased. In Madison, transit ridership was at an all-time high in 2013. Furthermore, from 2000 to 2011 the number of people bicycling to work in Milwaukee grew 227%. In Madison, the number of people bicycling to work grew by 147%. The Wisconsin PIRG Foundation urges Wisconsin to collect more data to understand the transportation preferences of young people; they assert that such data would ensure that Wisconsin is meeting the needs of the upcoming generation. WISPIRG also advocates for funding of transportation options like transit, bicycle, and pedestrian infrastructure to provide youth with options to not have to rely on a car.

2.2.4 Vehicle Miles Traveled

In 2004 the national total vehicle miles traveled (VMT) was 2.96 trillion (34). This number only increased to 2.97 trillion in 2013 (0.33%) despite a 7.7 % increase in population. Therefore, the growth in vehicle miles during this time period was seen to have stagnated. However, more recently released data in 2015 by the FHWA showed that VMT exceeded that in 2007 (13). This is a more recent trend which will be explored in studies such as this one.

The total number of VMT is affected by many characteristics. In general, people living in urban areas have lower VMT. In the 2009 NHTS, urban young adults aged 20-39 had an average of 24.3 daily VMT per capita; in rural areas this number is 35.2 (34). Of the Millennial aged population, about 32% live in urban areas (34). The NHTS data show a relationship between household income and VMT. In general as income increases, the per capita VMT increases. The Millennial generation has also delayed entry into the workforce and is delaying starting a family; both of these factors

lead to lower VMT. A change in living situations is also a characteristic of the Millennial generation. Many Millennials are renting or are staying home with their parents. On average young adults who rent travel about 20.3 vehicle miles and those who own their home travel about 30.5 vehicle miles (34).

Not all of the relationships among these characteristics have been fully studied, but there is evidence that the Millennial generation does have different travel characteristics and that these are affecting travel demands. Using the NHTS with upcoming GPS technology or cell phone tracking could help provide better data in the future to support the analysis of Millennial travel trends. (Note: A new set of NHTS data is currently being collected in 2016.)

Similar to Davis et al. (28), Dutzik and Baxandall (35) also compared driving trends between the 2001 and 2009 NHTS data sets. By similarly analyzing changing transportation trends within the NHTS data and historical U.S. VMT data, Dutzik and Baxandall (35) drew conclusions regarding the shifting trends in vehicle travel, and used projected population and demographic data from the U.S. Census Bureau to develop three projected VMT trends until the year 2040. They found that VMT in the U.S. has been decreasing since the year 2009, while vehicle ownership has been decreasing nationwide since 2006. They linked this decrease in VMT to a shift in driving trends among the Millennial generation, citing a 23% drop in VMTs by the age groups containing the Millennial generation from the years 2001-2009. The authors presented three predictions for the future (Figure 2):

- *Back to the Future*,
- *Enduring Shift*, and
- *Ongoing Decline*.
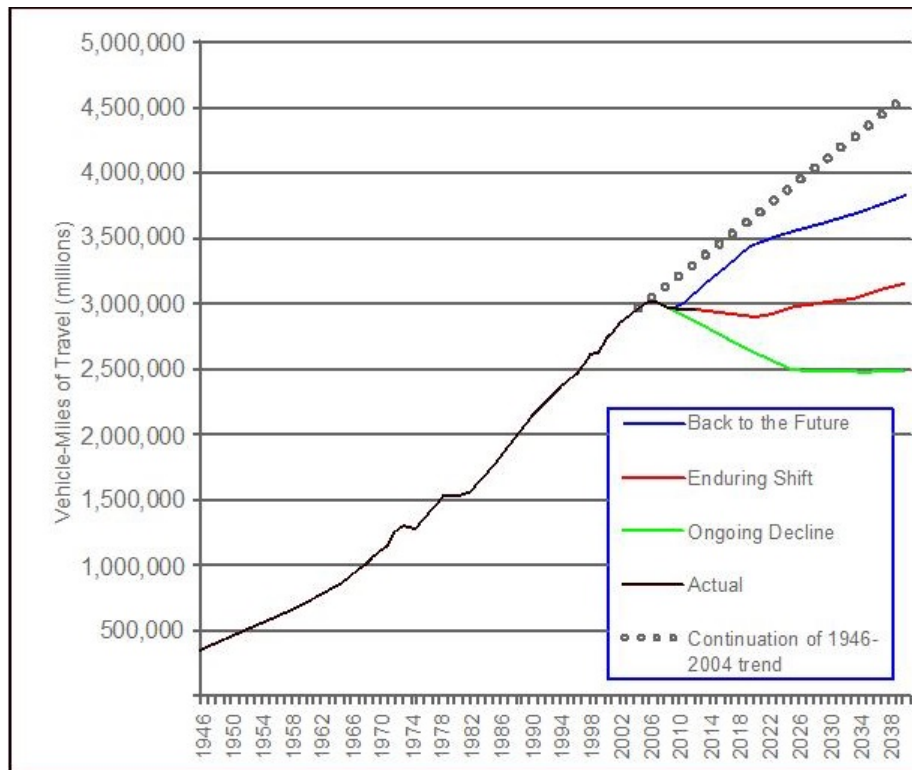
Figure 2: VMT Predictions (35)

Back to the Future assumes the average per-capita VMT according to age and sex will revert back to its 2004 level by the year 2020, and will continue to increase from then on. *Enduring Shift* assumes drivers of each age group will reduce or increase their driving by the same percentage they changed their driving in 2009 as compared to the older age groups. *Ongoing Decline* assumes the percentage change in driving trends by each age group from 2001-2009 will continue from 2009-2025. More recent data from FHWA in 2015 suggest that *Back to the Future* or *Enduring Shift* might be a more accurate prediction of future VMT (13). Yet, it seems that the future is more difficult to predict than it has been in the past, as discussed in a presentation, *The "Transportation Revolution" – How do Planners Grapple with an Uncertain Future*, at the 2016 Tools of the Trade Conference (36). New drivers are assumed to drive less than the youngest age group of 2009. Future VMT per capita were linearly interpolated from NHTS data. The VMT estimates from the three predictions (Figure 2) are uniformly lower than those produced in research studies that did not account for demographic composition. The results from these predictions suggest the nation's transportation policies need updating to accommodate future driving trends ((35), (37), & (38)).

Using large scale data sets to conclude that there is a decline in VMT among the Millennial generation, a number of studies propose a revision for existing transportation policies ((28), (35), & (39)). The studies call for the need to consider a range of possible travel trends while factoring in the uncertainty inherent in economic and demographic projections when evaluating cost and benefit of transportation projects. A common proposal developed among these studies is for the federal government to reallocate transportation funding to favor existing infrastructure repair, considering that currently 57% of highway funding is dedicated to expansion, despite 5 years of zero growth in vehicle travel. Shinkle et al. (2012) (39) use information obtained from real-estate

trend watchers, and surveys, to back up their opinion that transportation policies need to increase funding for transit-oriented development (TOD). TOD are housing, commercial uses and other amenities within walking distance of transit lines. They conclude that since 88% of Millennials want to live in urban locations, where there are numerous transportation choices available, new transportation policies should supply states with funding to support TOD in order to create these desired environments.

Polzin et al. (34) categorize the factors that affect VMT per capita in the United States according to data obtained from the 2009 NHTS and a survey on Millennials produced by the Pew Research Center. The approach taken to explain the nationwide decline in recent VMT rates is different from typical studies, which conclude the Millennial generation and their attitudes on transportation are the cause of VMT decreases without considering generation spanning factors that affect VMT rates. Polzin et al. (34) instead identified certain demographic factors (e.g. income, race, home ownership, family size, location, education, and vehicle ownership) that affect VMT per capita and compared their presence in the Millennial generation. The study found that 1) living in a rural location, 2) being educated, 3) owning a vehicle/home, 4) being of white ethnicity, 5) having kids, and 6) a high annual income, are all factors that increase daily VMT per capita rates. From these factors, the authors concluded that Millennials are driving less than any other generation due to their lower income level, low home and vehicle ownership rates, mainly urban residency, choice to prolong marriage and kids when compared to previous generations, and their diverse demographic characteristics.

2.2.5 Behavioral, Economic and Demographic Factors

Some studies have utilized quantitative surveys to acquire data on Millennial behavioral patterns ((6) & (29)). Through a mix of telephone and online surveys, Sakaria and Stehfest (6) evaluated 1,011 Millennials, over six urban locations (Boston, MA; Chicago, IL; San Francisco, CA; Seattle, WA; Portland, OR; and Washington D.C.) in the U.S. The survey concluded cost efficiency and convenience are valued most among Millennial mode choice. They also concluded that "ease of getting around" is the reason why Millennials live in urban settings. The Pew Research Center conducted a phone survey of 2,020 people nationwide, with 61% drawn from Millennials, to compare the Millennials' life choices to other generations (29). The survey was weighted for variances in landline and cellular telephones, and demographic differences with parameters obtained from the Census Bureau's Population Survey, and the 2010 Census. The study concludes Millennials are the most educated generation and are most likely to live in urban cities, with only 14% of the generation living in rural areas. From the survey's results on the lifestyle habits of Millennials, the Pew Research Center concludes the generational differences in transportation choices are the result of three processes: lifestyle effects, period effects, and cohort effects. The lifestyle effects process assumes that young people have different motivations today, but may be more similar to older generations in the future. Period effects include the major events in history and how they affect the generations differently based on age. Lastly, cohort effects are the events and trends in history that leave lasting impressions on young adults developing their core values.

Using data from the 2001 NHTS, Pucher and Renne (40) compared differences in transportation between urban and rural locations. They observed that on average rural households are making 5%

fewer personal vehicle trips per day, with the highest variation being in wealthier households, where rural residents are making 15% fewer *trips* per day than their urban cohorts. They also concluded that rural households travel 38% more <u>miles</u> per person per day than urban households, due to increased spacing between travel destinations in rural locations. The study concludes that with 0.1% of rural trips being made using public transit, compared to 4% of urban trips; this mode choice is irrelevant when evaluating transportation choices in rural locations.

Baxandall (41) compared driving trends at a state-wide level to disprove factors previously believed to be the cause of the recent national shift in driving trends. Using NHTS and the FHWA data, the study concludes that the declining rate of driving is not as closely related to economic trends, the recent trend of working at home, or the growth of urban populations, as was previously believed. The study finds that "among the 10 states with the largest declines in driving per person, only two rank among the ten with the largest increases in unemployment." It also points out that the states with the fastest rates of urbanization were not also simultaneously reducing driving, stating that four states with an increase in rural population showed a decrease in driving, while seven states that became more urbanized showed an increase in driving. With 46 of the 50 states showing a decline in driving since the end of the driving boom (the end of the period in which the number of miles driven by licensed driver increased annually), Baxandall also concludes that the Millennial generation is the leading cause of this decline due to a 23 percent decrease in average driving miles for those in the generation's age group.

A handbook of economic facts about the Millennial generation, produced by the White House's Council of Economic Advisers (42), offers explanations behind the behaviors of Millennials. The report claims that changes in generational behaviors are the result of experiences during formative years, such as the constant presence of technology, and the aftermath of the Great Recession (Note: The Great Recession reportedly began in December of 2007 with the end date not yet clearly defined (43).). The report concludes that from experiencing the recession Millennials are:
- Choosing to continue their education longer,
- Deciding to marry and start families later,
- Having less job fluidity,
- Experiencing a slower wage growth, and
- Reluctant to commit to homeownership.

These factors are affecting almost every aspect of Millennials' lives, and whether the Recession continues or not, the study reaches the conclusion that "that macroeconomic conditions in childhood and young adulthood shape individuals' trajectories for years to come and can have lasting impacts on wages, earnings, savings and investment patterns, and trust in institutions among these individuals" (42).

A report by The Nielsen Company evaluates the Millennial generation, also called the "social generation," to disprove assumptions made about it (44). Using Nielsen Pop-Facts data from 2013, the report determines a set of characteristics that sets Millennials apart from other generations including the generation's diversity, education, social life, and optimistic outlook. The report states that with 19% and 14% of the generation being Hispanic and African American, respectively, Millennials are the melting pot of generations. Adding to this, 23% of the generation has a Bachelor's degree, making Millennials the most educated generation. This report also states that

the social characteristics of Millennials have pushed them to live in urban locations, where social goals can be easily achieved in densely populated areas. Lastly the report comments on the optimism of the generation stating that 69% of Millennials are happy with their local communities, and 88% believe they will earn enough money to fund the lifestyle they want.

Twenge (4) critiques many of the studies on generational differences because they often compare different generations during the same time frame (i.e. Baby Boomers at present to Millennials at present). In contrast, Twenge performs her analyses by looking at the different generations when they were the same age (i.e. Baby Boomers in their 20s to Millennials in their 20s). The only limitations to this viewpoint, from the researchers' perspectives for the study at hand, is how technology has become a significant factor in everyday lives, and comparing generations at the same age will not account for these changes. Her book, *Generation Me: Why Today's Young Americans Are More Confident, Assertive, and Entitled – and More Miserable Than Ever Before*, provides a broad understanding of the socio-economic side of Millennials using these types of analysis. However, her definition of Generation Me (GenMe) includes individuals under 35 (age identified in 2006). Therefore, individuals who were born in the 1970s, 1980s and 1990s were discussed; it is a much broader generational grouping than the Millennials that many more recent studies discuss. Some of the conclusions that she reached that are similar to those in more recent studies include:

- GenMe marries later than previous generations
- GenMe is leaving the nest later (the number of twenty-six year olds living with their parents has almost doubled between 1970 and 2006)
- GenMe takes longer to finish college

Some conclusions that she draws that have not been discussed as much in recent literature include: 1) GenMe sees employment as a style of life, not a means to an end (like the Baby Boomer generation), 2) GenMe prefers to be self-reliant and independent, 3) GenMe wants to own a house that can afford as much space as possible for each family member, 4) 66% of college graduates owe more than $10,000 in school loans (5% owe more than $100,000), 5) GenMe prefers "directness rather than abstraction," and 6) GenMe prefers a positive assessment before critique of their work.

Twenge talks about the issues associated with GenMe's desire to be self-reliant and independent. As a result, they do not engage in community groups (e.g., Elks, the Jaycees, and PTA groups) as often as the Baby Boomer generation. However, she notes that as a result of the emphasis on self-reliance, members of GenMe are four times as likely to describe themselves as lonely as compared with the same numbers of Americans in 1957. Therefore, the researchers of this study question whether GenMe's increased use of public transportation is this generation's attempt to curb the higher level of loneliness. This would be an interesting point to investigate.

2.2.6 Location Choice

This section discusses Millennial preferences regarding housing choices, as land use and transportation go hand-in-hand.

Using data from the Transportation for America Survey, including information on 703 Millennials in ten urban locations (Chicago, New York City, San Francisco, Charlotte, Denver, Los Angeles, Minneapolis-St. Paul, Indianapolis, Nashville, Tampa-St. Petersburg), balanced with census data for gender, age, and ethnicity, Goldberg (2014) (45) reaches the conclusion that the motivation behind Millennials choosing to live in urban locations is multi-modal transportation choices, and the ability to rely on public and alternative transportation to work and live. He concludes that 54% of Millennials would consider moving to a location with better transportation choices, and 66% agree that access to efficient transportation choices is the number one factor considered when choosing where to live.

The Nielsen Company (44) also comments on the migration patterns of the Millennial generation by comparing the most concentrated areas of Millennials in the U.S. to those of the Baby Boomer generation (46). The study concludes that Millennials are choosing to live in areas that provide exciting creative hubs along with tightly spaced environments, which are both qualities present in urban locations. This study states that two-thirds of the Millennial generation live in rental homes, which suggests that members of this generation will continue to move to areas that fit their needs in the future (i.e. they are not limited by needing to buy and sell houses).

Lachman and Brett (2) used the responses from 1,241 surveys distributed via Zomerang to draw conclusions regarding Millennial preferences for housing. Survey responses were received from those located in rural areas, small towns, suburbs and urban cities. They found that communities that can offer the greatest "quality-of-life" can attract the most educated and creative of the Millennial generation. This finding coincides with Twenge's (4) finding that Millennials view jobs not as a means to an end, but as a life-style choice. Lachman and Brett's (2) study found that many renters reported receiving assistance from family to pay for monthly expenses. This coincides with other findings that Millennials are financially strapped. This also hints at some of what Twenge (4) has asserted, in that Millennials still have high expectations, but their means to achieve them do not necessarily coincide. Lachman and Brett (2) reported finding a larger number of homeowners than what was originally expected; however, they attribute some of this to the first-time homeowner tax credit. This does not necessarily mean that there is a large number of Millennial homeowners; rather, there is a larger number identified than what they hypothesized. Lachman and Brett did note that those who owned homes were also found to have a high level of education. When analyzing responses regarding community type, Lachman and Brett found the distributions shown in Table 4.

Table 4: Housing Location Type Represented in Sample

Type of Location	Percent of Sample Represented
In/Near Urban Downtown	12%
Other In-City Neighborhood	15%
Older Suburb	21%
Newer, Outlying Suburb	17%
Small City/Town	21%
Rural Community	14%

Lachman and Brett (2) also found that residents who are living in small communities also work there. Therefore, they concluded that if the resources are available in small communities, Millennials will live in small communities.

When asked to identify important neighborhood attributes, respondents identified community character (a.k.a. authenticity) as the primary factor. Proximity to work was identified as one of the top five. This would seem to contradict Goldberg's (45) finding that efficient transportation choices are the number one factor considered when choosing where to live; however, this difference more likely reflects how the question was asked (i.e. grouping the location of a house with work is different than asking about transportation mobility options in general), as compared to the actual preference. This is always a drawback of using surveys: stated preference may not correlate with actual behavior. Therefore, when consistencies are found, this can help draw more definitive conclusions from information found via surveys. Another important neighborhood attribute was safety. Considering that rural areas are often viewed as safe, this could be an aspect that small urban and rural communities could promote to try to attract Millennials.

Lachman and Brett (2) also found that the walkability of a community was more important to Hispanics and blacks as compared to whites (Table 5). Furthermore, they found that walkability is a necessity (not a preference) for members of the Millennial generation who cannot afford a car or who are living in a household where a car is shared among several people.

Table 5: Value of Walkability by Race & Ethnicity

Importance of Shopping and Social Gathering Place Being within Walking Distance of Home	Hispanics	Blacks	Whites	TOTAL
Essential	24%	21%	12%	14%
Preferable	47%	49%	49%	50%
Not an Issue	29%	30%	39%	36%

Interestingly, although the study seemed to find that there is a preference for walking, the majority of respondents still indicated that they get to work by driving (Table 6).

Table 6: Mode of Travel to Work

Mode	Age (18-24 years)	Age (25-32 years)	TOTAL
Drive	69%	74%	72%
Public Transit	7%	7%	7%
Walk or Bike	6%	4%	5%
Combination of Two of Above	12%	10%	10%

Therefore, there is the potential that a work trip is primarily done by automobile, while other trips are done with other forms of transportation that do not require a timely arrival. This of course cannot be confirmed or disputed by the aforementioned studies. However, it is interesting to note that a notable proportion of respondents (10%) used a combination of modes in getting to work. This coincides with a finding from a study in Germany (26); therefore, there is the potential that Millennials are not completely abandoning the use of the automobile. Rather, they see it as one transportation option of several, and they value locales that allow for a multitude of options.

Another interesting point to note from Table 6 is that there is a small, but subtle difference between older Millennials as compared with younger Millennials. Differences within a generation, as discussed by Twenge (4), can be found.

2.2.7 Technology Preferences

Research suggests that Millennials have a strong preference for technology, particularly to remain connected. This section discusses Millennial technology preferences, particularly as they relate to transportation.

Schwieterman's article, *The Travel Habits of Generation Y* (8), addresses the increasing use of technology and its effect on Millennials' travel choices. Schwieterman found an increase in transit usage, especially bus and train travel when available, in order for young adults to remain connected to their electronic devices. These "techno-travelers" are more connected than ever and prefer to use their commute time to remain as productive as possible. "Techno-travelers" are on the rise in urban areas where transportation infrastructure is already in place and where mobile networks are expansive. To understand technology use during travel, the Chaddick Institute tracked passenger activity data on trains, buses, and airplanes during 2009 and 2010 in 13 states and the District of Columbia, as well as on the French TGV and Spanish AVE high-speed trains and VIA Rail Canada (8). The study counted passengers who were using an electronic device including: cell phone, smartphone, iPod, laptop computer, or DVD player. It was found that technology usage increased between 2009 and 2010. Buses and trains had clear advantages with about 42.7% of passengers using electronic devices on curbside buses and 35.7% on Amtrak trains (8). About 24% of passengers used technology on airplanes, but it needs to be factored in that devices must be shut off for part of a flight (Note: This was true during this study.). The lowest technology use was on Greyhound buses, which have just begun to offer on-bus WiFi on select routes. This study shows that technology is increasingly becoming a factor in transportation choices for Millennials.

In another article, Row discusses how: 1) three-quarters of Millennials use social media, 2) less than half of teens eligible to obtain a driver's license actually do, and 3) almost forty-percent of Millennials indicate that they can get around without a car (47). She indicates that the Arizona DOT uses Twitter to distribute traffic updates and get feedback on highways and services. She recommends using an application developed with rewards, badges, and other acknowledgements in order to encourage participation. Using rewards and other incentives coincides with Twenge (4), who found that since Millennials grew up with constant positive reinforcement, they continue to look for this as adults.

Lockbridge (48) conducted a study of 1490 individuals within the U.S., with ages ranging from 18 to older than 65. They were surveyed using Google Consumer Surveys to obtain information regarding their desires for technologies associated with vehicles. It seems that younger generations place more value and have a higher appreciation for technologically advanced vehicles. Respondents from the 18-24 and 25-34 age brackets indicated that they are willing to pay more for technology that makes a safer vehicle as compared with other age brackets (i.e. 35-44, 45-54, 55-64, and 65+). Similar findings resulted from questions regarding the value of being "more entertained" in a vehicle. Respondents from the youngest age group (18-24) were most likely to

indicate that they value being connected in their vehicle as compared to the other age groups. Finally, the middle age groups (25-34 and 35-44) were most likely to value the ability to be productive using technology in their vehicle. Lockbridge (48) concluded that "Millennials want cars that know who they are."

Millennials have embraced all things digital. Earning the nickname "digital natives," Millennials have grown up with fast changing technology and have had technology available at their fingertips their entire lives. Internet and mobile phone technologies have expanded and increased in the U.S. over the last decade, and Millennials are the biggest supporters of these changes. A 2010 nation-wide Pew Research Center survey obtained 2020 responses, with 830 of these responses from the Millennial age group (18-29 years old) (29). This survey found that 24% of respondents said that technology use was what made the Millennial generation unique (29). A majority of Millennials find that technology makes their lives easier, and allows them to effectively use their time. Cell phones are becoming more of a necessity. Ninety-four percent of the Millennial age group owned a cell phone, and were more likely to rely on a cell phone as their only communication technology (no landline) (29). Mobile phones are a quick and easy way to get updates from social media, get directions using turn-by-turn navigation, find out when the next bus is coming, purchase a ticket, and schedule rideshare or taxi services (Figure 3).
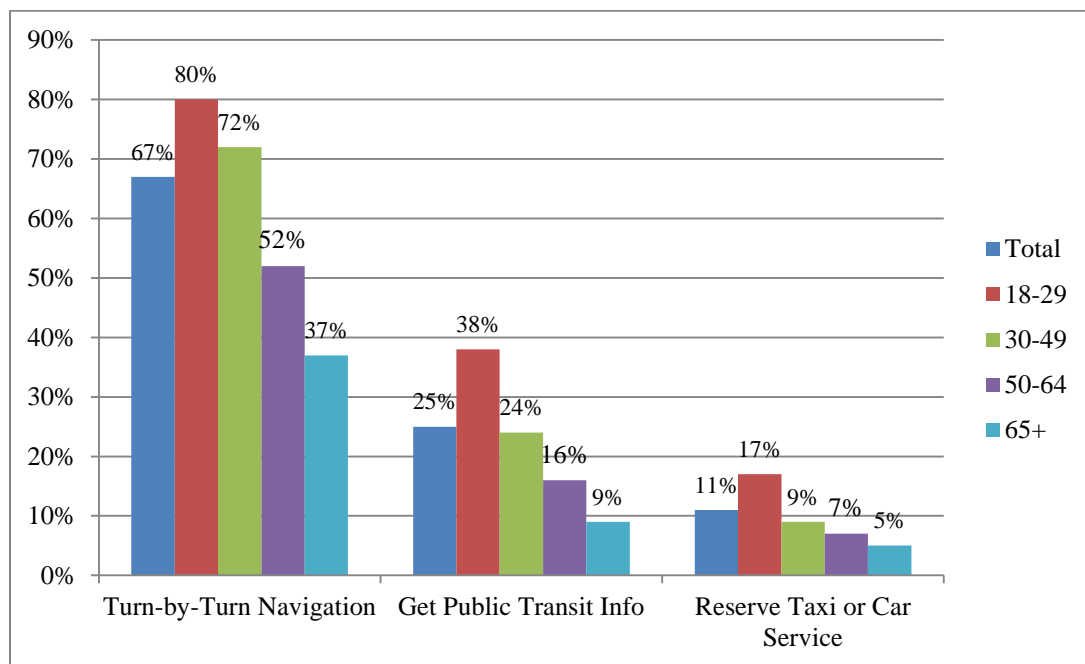
Figure 3: U.S. Adult Smartphone Owners in Each Age Group Who Use Their Phones Frequently or Occasionally for Transportation Information (49)

KRC Research conducted a survey of 1015 adults in 2012. This study found that, "nearly two in three (65%) of Millennials say losing their phone (30%) or computer (35%) would have a greater negative impact on their daily routine than losing their car (28%)" (50). Many claim the fear of missing out on something is the biggest reason they check their phone throughout the day. About 75% of Millennials have a social media profile (51).

Public transit agencies can use these technologies to enhance their communication with customers. Social media is especially useful for transmitting pertinent information to customers during service disruptions. Social media also gives customers the chance to respond to transit agencies, allowing two-way communication. Quick, up-to-date traffic information is in high demand around the country, as shown by many radio stations updating listeners on traffic and weather every 10 minutes throughout the day (52). Social media sites like Twitter help supply the public with time-sensitive information such as traffic or transit delays. The more information that gets out to the public, the better travel decisions people can make.

Chan and Schofer (52) studied the use of social media by transit agencies in New York City during Hurricane Sandy in 2012. During their literature review, they cited a source that reported that 83%, 77%, 52%, and 32% of adults in the U.S. aged 18-29, 30-49, 50-64, and 65+, respectively, used social media websites. Hurricane Sandy caused major disruptions to transit agencies around the city. This study examines Twitter usage by three transit agencies in New York City: Metropolitan Transportation Authority (MTA), New Jersey Transit (NJT), and Port Authority Trans-Hudson (PATH). During Hurricane Sandy all three services were shut down. Each agency used their Twitter feed to provide their customers with information on shutdowns, any damages experienced, and restoration efforts (52). These three agencies saw tweet rates rise during this event, as they kept the public informed about the condition of transit services.

Table 7: Tweets Associated with Hurricane Sandy, October 28-November 12, 2012 (52)

Originating Agency	Daily Average Tweet Rate* (tweets per day)	Associated with Hurricane Sandy	
		Daily Average Tweet Rate (tweets per day)	Number of Tweets
MTA	4.6	31.5	473
NJT	12.5	96.9	1453
PATH	15.9	44.2	663

*Normal rate was measured by averaging tweets sent per day from January 4, 2013 through January 31, 2013.

Both the NJT and PATH responded to customer response tweets as questions came up about closures, route changes, and any other issues, as an alternative to their call centers. These response tweets made up about 66% of all tweets sent out by PATH and NJT. (52) There is a demand for this type of interaction with transportation agencies. More research into the value that riders place on social media would be useful for transit agencies interested in making social media an effective communication tool.

2.3   Literature Review Summary

Through the literature review, it was found that Millennials were discussed in terms of five overarching areas: 1) more transportation options, 2) higher levels of education and corresponding debt, 3) technology, 5) living situation and location, and 6) environment, employment, and independence.

2.3.1 More Transportation Options

Much of the literature commented on Millennial transportation preferences. Millennials reported to be open to non-auto forms of transportation and typically choose the mode that best fits the trip type. One report suggested that Millennials showed an interest in public transportation because they 1) believed it saved them money, 2) is convenient, 3) allows them to socialize online, 4) helps to protect the environment, and 5) allows them to connect with their community. It was also suggested that Millennials are using public transportation to "curb loneliness." According to one source, Millennials place transportation options among their top three concerns when choosing where to live whereas another study indicated it was the number one factor. Literature also suggests that the Millennial generation interest in public transportation is not just constrained to those who are financially strapped; in one example, Millennials earning $70,000 or more were found to make use of alternative transportation modes. Findings to date seemed to indicate that single Millennial households were less likely to own vehicles. Millennials were also reported to prefer living in walkable neighborhoods. While Millennials are reportedly more ethnically and racially diverse than previous generations, one study reported that those who identified ethnically as Hispanic or racially as Black/African American reported that a walkable environment was more important. In addition, one study found the following factors influence use of a personal vehicle: 1) rural, 2) educated, 3) owning a vehicle or home, 4) white, 5) children, and 6) having a high annual household income.

Some states have performed state-specific studies to understand how to retain Millennials. Vermont found that their current transportation system was viewed by younger residents as presenting few options, particularly because public transportation was not convenient based on timing and service hours, and that connections between rural and urban areas of the state were lacking. They also reported a concern regarding the safety of bicycling in the state due to limited infrastructure to support this mode. While Millennials clearly express an interest in public transportation, when looking at the mode share of different types of transportation options, driving was found to dominate. Further, older Millennials (25 to 32 years in age) were found to prefer driving more than younger Millennials.

2.3.2 Higher Educational Attainment & Student Debt

The media has purported Millennials to be one of the most educated generations. In fact, one study reported that almost one quarter of Millennials have a Bachelor's degree.

However, a drawback to the higher level of educational attainment for the Millennial generation as compared with previous generations is the cost of this education. One study reported that two-thirds of those 35 or younger (in 2006) owe more than $10,000 in student debt. Furthermore, approximately 5% of this same age group has a staggering $100,000 or more in student debt.

2.3.3 Technology

Millennials have been reported to be enthusiastic adopters of technology. One source called Millennials "techno-travelers." Another study reported that at least three-quarters of Millennials made use of social media. In fact, one report indicated that almost ninety-five percent of Millennials reported owning a cell phone. It is no surprise then, that Millennials have been described as being dependent upon connected technologies. State DOTs have also reported using technology as an effective means of communication during extreme weather events, like Hurricane Sandy.

2.3.4 Living Situation & Location

The literature reported that Millennials are living with family or friends more frequently when compared with previous generations.

Millennials have reported a desire to live in urban areas by many accounts. One study suggested that as few as fourteen percent of Millennials live in rural areas. One possible explanation for this finding may be that many Millennials relocate to urban areas for their education and then stay in this area because they find a job there. Some of the areas that have been suggested as showing particular interest to Millennials might be described as "new urbanism," "smart growth," or TOD. More generally, Millennials desire to live in a location that has a "sense of community," a place that is authentic.

2.3.5 Environment, Employment, and Independence

Millennials have been reported to show more concern about environmental awareness. Yet, as discussed in the Pew Research Center study, this interest could just be a product of a "life stage effect."

A large percentage (almost forty percent) of "young people" (could extend from beyond Millennials to Generation X), are said to be out of work or underemployed.   These conditions can limit the ability of such a person to pay back student debt and may limit their discretionary income, all potentially impacting how the person may choose to travel.

Another characteristic associated with this generation relates to individualism. One source, who grouped Millennials and Generation X, reported that this group is self-reliant and independent.

3 METHODOLOGY

A mixed-mode survey, using both online and telephone, was chosen for this study in order to balance the desired number of survey respondents with cost. Four states, Minnesota, Montana, Wisconsin, and Washington, were the focus of the data collection. Due to the rural nature of some areas of the focus states, using the telephone was necessary to obtain input from residents in these areas. While the telephone surveys increased the cost of the project, they also helped researchers collect sufficient data to allow for statistically valid sample sizes. The goal was to collect the majority of the data (60%) in non-MSA areas, which are most representative of rural areas, and 40% in MSA areas. Of these populations, approximately 60% of respondents were to be categorized as Millennials over the age of 18. For this study, Millennials are defined as being born between 1983 and 2000. However, again, the survey respondent must be at least 18. The remaining populations could consist of any of the other generational cohorts: the Silent Generation, Depression & War Babies, the Baby Boomers and Generation X.

All of the surveys, both online and by phone, were collected through the subcontractor, Survey Sampling International, Inc (SSI). This firm were chosen because it offered the ability to reach survey respondents online and conduct augmented surveys via telephone (both landline and cell phone). Additional information about SSI's panels can be found in Appendix A, which provides SSI's responses to the World Association of Opinion and Marketing Research Professionals' (ESOMAR, formerly European Society for Opinion and Marketing Research) *28 Questions to Help Research Buyers of Online Samples*.

4   DATA COLLECTION

Data was collected in three phases for the project: 1) online, phase I, 2) telephone, 3) online, phase II. Originally, the scope only included an online and telephone phase; however, due to challenges with obtaining the desired sample from Montana, additional data was collected through a second phase of online data collection, as SSI's potential survey respondents change over time.

Phase I of the online data collection occurred from October 22, 2015 through November 9, 2015. 1,441 raw surveys were collected, although only 1,276 surveys were retained. Respondents for the retained surveys provided their 1) age, 2) state, 3) zip code, and 4) completed at least 75% of the survey.

The telephone data collection effort occurred from November 13, 2015 through December 15, 2015. During this phase, 1,188 raw surveys were collected, although only 1,185 surveys were retained. Again, respondents for the retained surveys provided their 1) age, 2) state, 3) zip code, and 4) completed at least 75% of the survey.

Phase II of the online data collection occurred from December 16, 2015 through December 23, 2015. During this phase, 74 raw surveys were collected.

In total, 2,535 surveys were collected that were considered for use in the analysis. After reviewing IP addresses for duplicates, and further looking at the information provided, the final data set consisted of 2,519 survey respondents.

5   RESULTS

This section first presents modeling results based on NHTS data. The remaining sections are based off of the data collected for the study. The survey questions were divided into three categories: demographics, transportation, and lifestyle. Additional information regarding the results of the questions for these three categories can be found in the technical memorandums for each of the topic areas ((53), (54), & (55)). What follows are the most significant findings from each of these sections.   In addition, cross-cutting analyses were subsequently performed, which typically involved considering multiple questions. Furthermore, some modeling results are discussed. This section concludes with a summary of the most significant findings.

5.1   National Household Travel Survey Findings

As a part of this research effort, the researchers took a look at the 2009 NHTS data focusing on what could be understood from the data from a rural perspective. This was of particular interest considering that few of the studies that were found when reviewing existing literature provided information related to rural areas.

The 2009 NHTS sample includes 4,202 Millennials (those born between 1983 and 2000) living in rural areas (the rural categorization was done based on block group). This is about half the number of Millennials living in urban areas (Figure 4).
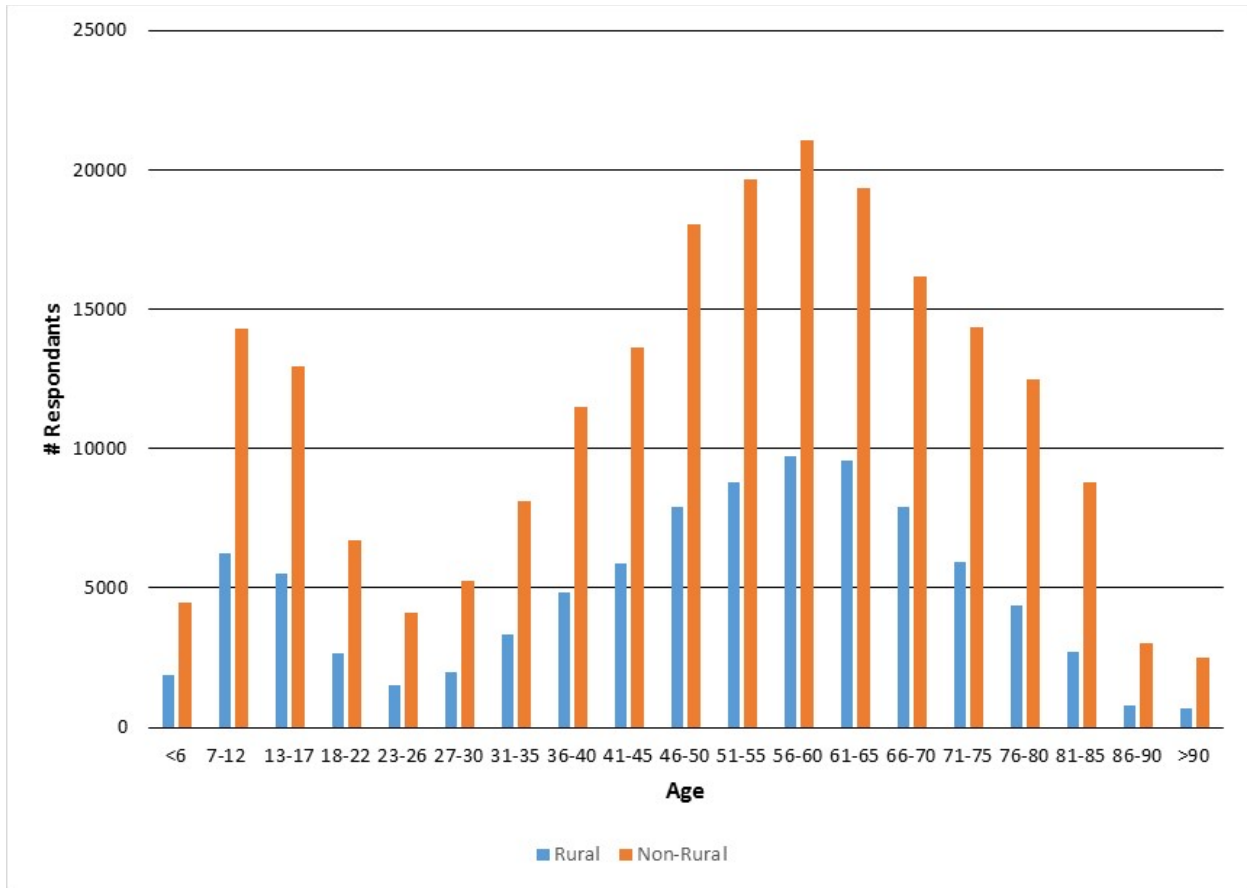
Figure 4: Age Distribution of the NHTS Sample in Rural and Non-Rural Areas

Table 8 provides a summary of the number of respondents from the stakeholder states (Minnesota, Montana, Washington and Wisconsin) of any age and within the Millennial age group.

Table 8: NHTS Rural Sample, by State, and Age

State	Sample Size			
	All Ages	Percentage of TOTAL	Millennials (16-30 years)	Percentage of TOTAL
Minnesota	219	0.24%	10	0.24%
Montana	283	0.31%	16	0.38%
Washington	196	0.21%	8	0.19%
Wisconsin	1497	1.62%	69	1.64%
TOTAL	92,381	-	4,202	-

The researchers wanted to learn more about what factors influenced travel in rural areas. Therefore, data from the 2009 NHTS was used. A model was developed using the data that at a block group level was identified as being "rural." The model aims to identify what factors contribute to greater VMT. VMT is represented by the YEARMILE variable from the 2009 NHTS sample, which means "miles respondent drove in the last 12 months."

Table 9 shows the results of variables that were found to be statistically significant. The discussion that follow considers findings as deduced from these variables.

Table 9: Regression Coefficients of the Miles Driven Model

Variable	Estimate	Std. Error	t-value	Pr(>|t|)	Significance
(Intercept)	8.004	0.052	153.01	2.00E-16	***
DISTTOWK	0.003	3.10E-04	10.72	2.00E-16	***
HBPPOPDN	-3.02E-05	2.61E-06	-11.57	2.00E-16	***
Low-med Inc.	0.473	0.035	13.55	2.00E-16	***
Med Inc.	0.712	0.036	19.60	2.00E-16	***
High Inc.	0.827	0.036	22.83	2.00E-16	***
HHSIZE	-0.036	0.007	-5.176	2.29E-07	***
HHVEHCNT	0.069	0.007	10.77	2.00E-16	***
GenX	0.468	0.037	13.88	2.00E-16	***
Boomer	0.347	0.032	10.77	2.00E-16	***
GenGreat	0.100	0.036	2.80	2.00E-16	***
Dwelling.Multi	-0.087	0.022	-3.99	6.50E-05	***
Female	-0.458	0.015	-31.06	2.00E-16	***
Full-time	0.522	0.020	27.12	2.00E-16	***
Part-time	0.423	0.025	16.95	2.00E-16	***
MultiJob	0.767	0.084	8.67	2.00E-16	***
NBIKETRP	-0.016	0.008	-1.50	0.1327	
NWALKTRP	0.006	0.001	6.76	1.43E-10	***
PTUSED	-0.003	0.001	-4.53	6.02E-06	***
Number of Observations = 21,958					
R^2 = 0.2255					
Adjusted R^2 = 0.2249					
F-statistics: 354.9 on 18 and 21939 DF, p-value: <2.2e-16					
Significance codes: 0'***'; 0.001'**'; 0.01'*'; 0.05'.'					

As the distance to work (DISTTOWK) increases, the VMT by a rural respondent increases. This is as expected.

As the population per square mile (POP_DEN) increases, the VMT decrease. Generalizing, this result shows that as the population becomes denser, there is less travel by personal vehicle. This is particularly interesting because this model focuses on rural areas. This means that a more dense rural area has less travel by personal vehicle. This cannot tell us whether people in denser rural

areas make fewer auto trips, or if there are trips made by other modes that do not add to the vehicle miles traveled. Again, this variable is as expected.

Variables (Low-med Inc, Med Inc, and High Inc, respectively) were created for households whose annual income was between $15,000 and $50,000; $50,000 and $80,000; and more than $80,000. Therefore, the findings for each of these groups are compared with those who earn less than $15,000. The comparison showed that for each successively higher group of annual income earned, the VMT increased. Furthermore, the correlation of these variables increases with each income category. This agrees with findings from studies in general; however, this is of particular interest because this holds true for rural areas.

As the household size (HHSIZE) increases, the VMT decrease.

As the number of vehicles in a household (HHVEHCNT) increases, the VMT increase. This result is as expected in that those with many vehicles likely value or see traveling via a vehicle as the only transportation option. It may very well be that this is the case.

Three variables (GenX, Boomer, GenGreat) were created to represent the different generations, using the Millennial generation as the default variable. The results support what is found in the literature. However, again, these results are specific to rural areas. The Depression and War Babies generation (GenGreat) represent an increase in vehicle miles traveled as compared to Millennials of approximately 33%. The Baby Boomers travel approximately 50% more than the Millennial generation. Finally, Generation X travels approximately 66% more than the Millennial generation, almost twice as much as the Depression and War Babies generation. Generation X now makes up most of the work force; therefore, that they represent a larger portion of the VMT as compared with the Depression and War Babies generation is expected.

A variable was created to represent households with multiple families (DwellingMulti). The findings show that there is a decrease in VMT for households with multiple families. This makes sense because whereas if an adult and his or her adult children were living separately, each household would have to make separate trips to the grocery store. However, since these generations are living together, they can make one trip to the grocery store.

An interesting finding from this model is in relationship to gender (i.e. variable Female). The results show that women in rural areas contribute less to vehicle miles traveled as compared with men. One potential explanation is that men typically travel longer distances to reach their places of employment. Some could speculate that it is because there may be more stay-at-home moms in a rural setting. However, some studies often say that household duties often require more trips. Yet it could be that these amenities are closer than places of employment.

A full-time (Full-Time) and part-time (Part-Time) variable were created. They are compared with individuals in rural areas who are unemployed. The findings show that those who are employed full-time contribute to the VMT more than those who are employed part-time. This makes sense because it is likely that part-time employees may only work a few days out of a week as compared to the typical five.

Those with multiple jobs (MultiJob) were found to contribute more to VMT in rural environments. Again, this is not unexpected, as it is likely they will have to make a trip for each job.

As the number of bike trips (NBIKETRP) increased, the contribution to VMT decreased. This could show that some respondents replace some of the trips that would have been made by vehicle

with biking. In contrast, it was found that the number of walking trips (NWALKTRP) increased the VMT. This variable is unexpected. However, one possible explanation is that individuals first drove to where they wanted to walk. Therefore, walking trips were done more for a recreational purpose, if this hypothesis is correct.

Not unexpectedly, public transportation trips (PTUSED) helped to decrease the number of VMT. Furthermore, the variable shows that there is a very small influence of this variable, which is consistent with the small impact of public transportation in rural areas (see Pucher and Renne (40)).

5.2   Demographics

Ten of the sixty questions from the survey were categorized within the demographics category. They are: 1) state of residence, 2) zip code, 3) age, 4) area type, 5) gender, 6) racial identity, 7) ethnicity, 8) education, 9) student loans, and 10) annual income.

All of the questions are analyzed based on the residential "Area Type" that was reported by the survey respondent. As such, what follows is a discussion of how area type and MSA and non-MSA areas overlap.

5.2.1 Area Type

What is the best way to define an urban and a rural area? The data for the research project was collected so that urban areas were represented by MSA and rural areas were represented by non-MSAs. However, when reviewing open-ended responses for why or why not respondents see the need for additional public transportation provisions, bicycle facilities or sidewalk connections, many of the respondents who were categorized as living in an MSA area indicated that their area was rural. For example, one respondent, who was according to the MSA/non-MSA convention categorized as living in an MSA area, indicated that:

"I live in a quiet, rural community."

Some of this error in assignment stems from the fact that MSA and non-MSA boundaries do not directly align with zip code boundaries. There are some zip codes that span over MSA and non-MSA boundary lines (see red lines in Figure 5). The bottom right corner of Figure 5 shows a close-up of the cyan boxed area.
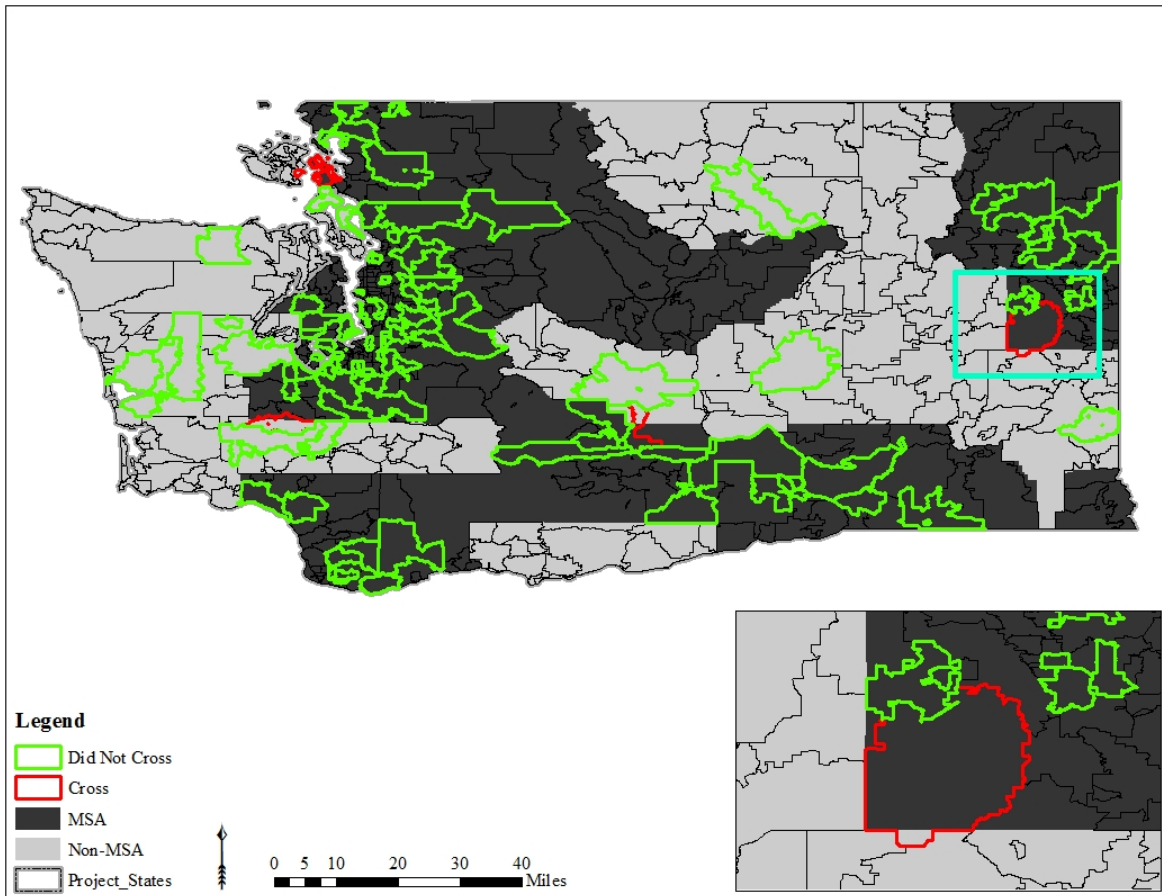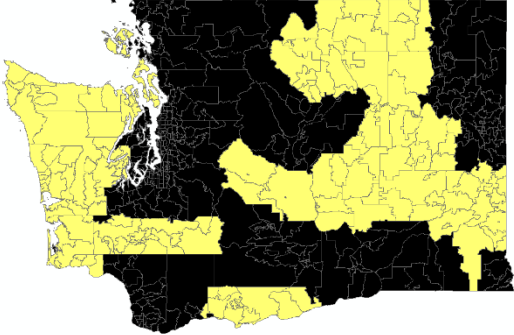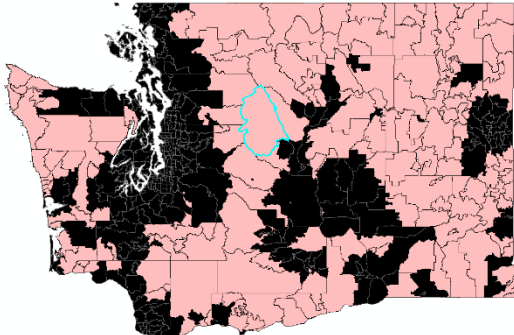
Figure 5: Example of Zip Codes, Shown in Red, that Cross MSA vs. Non-MSA Boundaries

Another effort to define rural and urban based on the rate of population density to the land area covered by the zip code (e.g. 20 people per square mile) was investigated. In particular, there were concerns that parts of Washington State were classified as an MSA when they might be more accurately categorized as rural.

Table 10 presents the comparison of definitions using MSA (in black) and non-MSA (yellow) as compared with urban (black) and rural (pink) using a 20 people per square mile cut-off.

Table 10: Comparing MSA/non-MSA to Urban/Rural (20 people per square mile) in Washington State

MSA vs. non-MSA	Urban vs. Rural (20 people per square mile)

This approach also showed conflicts between the urban classifications and perceptions of residents who responded with:

"It's a rural area..."

Question 50 asked, "How would you describe the area where you currently live?" Seven potential choices were given:

        1) Big, dense city;

        2) Big-city suburb;

        3) Lower-density city;

        4) Suburb of lower-density city;

        5) Small city;

        6) Small town; or

        7) Outlying rural area.

When looking at MSA and non-MSA categorizations as compared with the qualitative responses provided by respondents, in general, "Big, dense city;" "Big-city suburb," "Lower-density city," and "Suburb of Lower-Density City" represented "MSA" or the "urban" categorization. "Small town," and "Outlying rural area" represented "non-MSA" or "rural." "Small city" seems to represent the boundary between an MSA and non-MSA categorization, specifically where many people are categorized as "MSA" even though they feel they live in rural environments. Therefore, this would seem to be the category where MSA and non-MSA designation do not match well with actual area type. It provides confidence within the alternative proposed classification as the researchers would expect to see that the results are mostly consistent, with some variability in the interior categories of area type, as was found. See Table 11 for the results when comparing a survey respondent's categorization of their area type with the official MSA/Non-MSA categorization.

Table 11: Comparing MSA and Non-MSA to Area Types

		Big, Dense City	Big-City Suburb	Lower-Density City	Suburb of Lower-Density City	Small City	Small Town	Outlying Rural Area	No Response
Minnesota	MSA	52	127	28	66	24	32	33	3
	Non-MSA	5	4	13	3	51	96	84	2
	NA	0	0	0	0	0	0	0	0
Montana	MSA	3	12	46	18	139	80	60	1
	Non-MSA	1	1	3	5	25	75	163	1
	NA	0	0	0	0	1	0	0	0
Washington	MSA	48	96	30	73	38	36	52	3
	Non-MSA	2	1	7	9	22	103	110	2
	NA	0	0	0	0	0	0	0	0
Wisconsin	MSA	31	63	59	56	87	35	37	3
	Non-MSA	0	3	8	7	60	98	77	2
	NA	0	1	0	0	0	0	0	0

Therefore, the following summarizes how "urban" and "rural" will be defined throughout the data analysis.

Table 12: Urban vs. Rural Relationship to Area Type

Urban	Rural
Big-dense city	Small city
Big-city suburb	Small town
Lower-density city	Outlying rural area
Suburb of lower-density city	

In Table 13, the shaded areas, which represent the classifications of "Small City," "Small Town," and "Outlying Rural Area," can all be perceived as "rural." Therefore, with this assumption, a large portion, or about two-thirds of the data, came from rural respondents. Again, as the purpose of this study was to fill a gap in the understanding of the mobility mindset of Millennials in small urban and rural areas (e.g. areas with a population less than 200,000), a greater number of responses were purposefully collected from rural areas.

Table 13: Survey Respondent Count by Generation and Area Type

	Big, Dense City	Big-City Suburb	Lower-Density City	Suburb of Lower-Density City	Small City	Small Town	Outlying Rural Area	No Response	TOTAL
Millennials	84	204	131	143	287	340	317	9	1,515
Generation X	26	59	33	37	71	72	85	2	385
Baby Boomers	25	33	23	46	74	110	159	5	475
Depression & War Babies	8	11	7	9	15	30	53	0	133
Silent Generation	1	0	0	0	2	1	5	2	11
Sub-Total	144	307	194	235	449	553	619	18	2,519
Total Count	880				1,621			18	2,519
PROPORTION	34.9%				64.4%			0.7%	100%

The company that collected the data indicated that MSA and non-MSA are the only manner in which they could identify potential survey respondents by urban and rural areas. As discussed previously, while generally the MSA/Non-MSA categorizations matched with how survey respondents classified their area type, in the areas of overlap like in "Small City" (Table 11), using a survey respondent's classification instead of the MSA/Non-MSA categorization, which tends to be "big picture," helps to take into account some of the discrepancies associated with MSA/Non-MSA classification and zip codes. Consequently, the majority of survey respondents sampled are still from more rural environments (Table 13). Figure 6 shows that there are a larger number of Millennial survey respondents from rural areas as compared with urban areas.
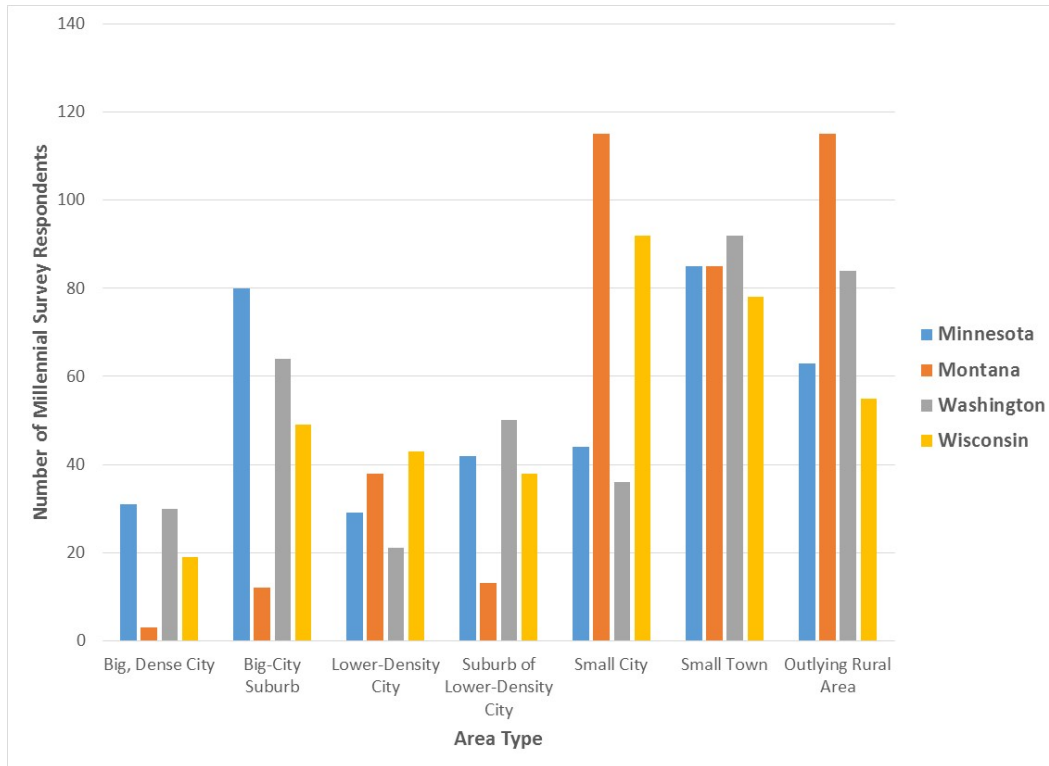
Figure 6: Number of Millennial Survey Respondents by Respondent-Identified Area Type

Also interesting to note is that Montana has very little representation in the "urban" categories of "Big, Dense City," "Big-City Suburb," "Lower-Density City," and "Suburb of Lower-Density City," which for this study have been defined as "urban."

5.2.2 State of Residence

Table 14 shows the breakdown of survey respondents by state, generation and area type.

Table 14: Number of Survey Respondents by Generation, by State, by Area Type

Generation	State	Big, Dense City	Big-City Suburb	Lower-Density City	Suburb of Lower-Density City	Small City	Small Town	Outlying Rural Area	No Response	Total
Millennials	Minnesota	31	80	29	42	44	85	63	3	377
	Montana	3	12	38	13	115	85	115	0	381
	Washington	30	64	21	50	36	92	84	2	379
	Wisconsin	19	49	43	38	92	78	55	4	378
	Sub-Total	83	205	131	143	287	340	317	9	1515
Generation X	Minnesota	13	28	7	12	12	20	21	0	113
	Montana	0	1	4	2	14	13	24	1	59
	Washington	8	18	8	14	13	19	23	1	104
	Wisconsin	5	12	14	9	32	20	17	0	109
	Sub-Total	26	59	33	37	71	72	85	2	385
Baby Boomers	Minnesota	11	17	4	12	14	18	26	2	104
	Montana	1	0	4	7	31	44	64	1	152
	Washington	7	12	6	13	9	22	40	1	110
	Wisconsin	6	4	9	14	20	26	29	1	109
	Sub-Total	25	33	23	46	74	110	159	5	475
Depression & War Babies	Minnesota	2	6	1	2	4	7	7	0	29
	Montana	0	0	3	1	5	11	18	0	38
	Washington	5	3	2	4	2	4	15	0	35
	Wisconsin	1	2	1	2	4	8	13	0	31
	Sub-Total	8	11	7	9	15	30	53	0	133
Silent Generation	Minnesota	0	0	0	1	1	0	0	0	2
	Montana	0	0	0	0	0	2	2	0	4
	Washington	0	0	0	1	0	2	0	1	4
	Wisconsin	0	0	0	0	0	1	0	0	1
	Sub-Total	0	0	0	2	1	5	2	1	11
TOTAL		142	308	194	237	448	557	616	17	2519

5.2.3 Zip Codes

Figure 7 through Figure 10 show the reader the spatial distribution of survey respondents for Minnesota, Montana, Washington State and Wisconsin. The reader can refer to the *Mobility Mindset of Millennials in Small Urban and Rural Areas: Technical Memorandum, Survey Findings - Demographics* (53) for additional figures that show the distribution of each generation for each state.
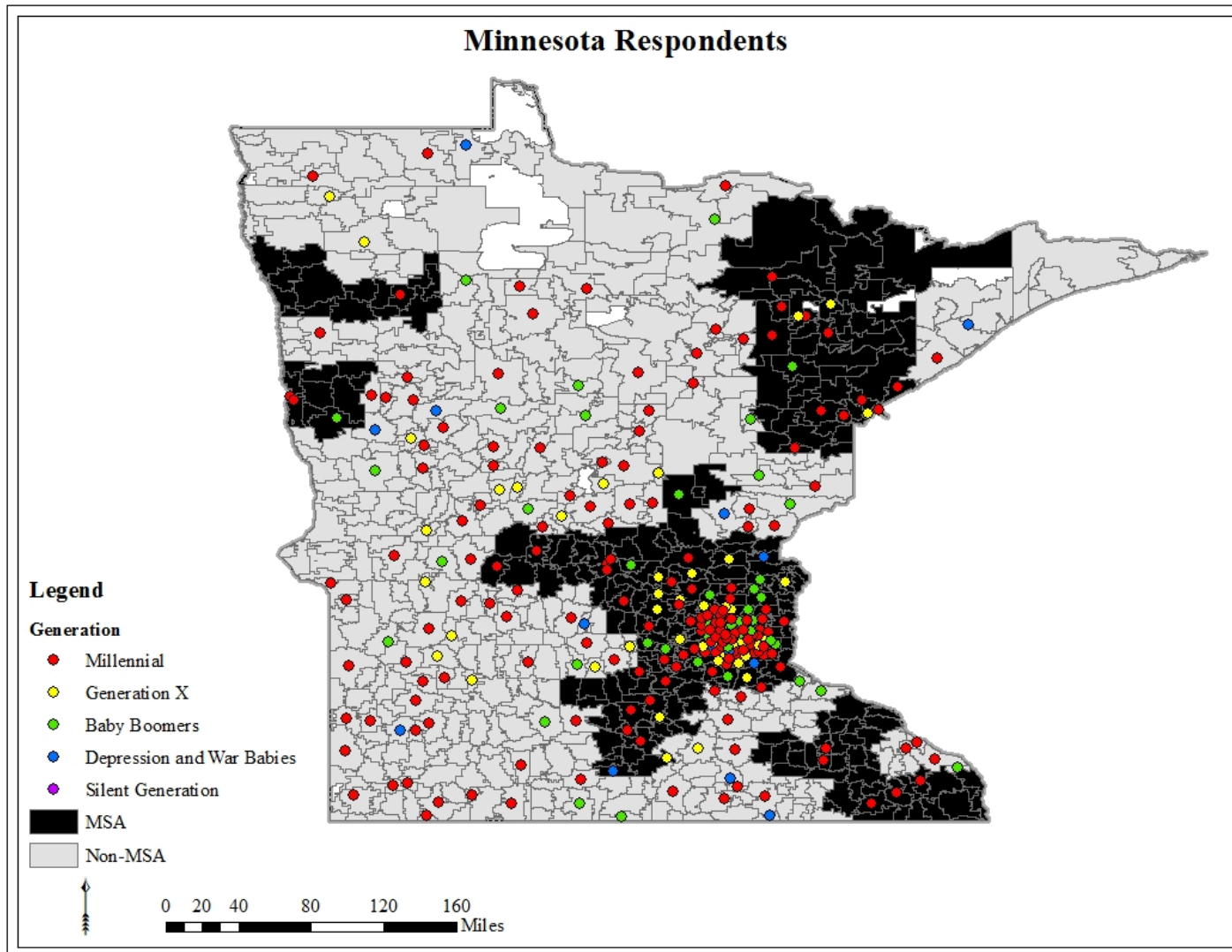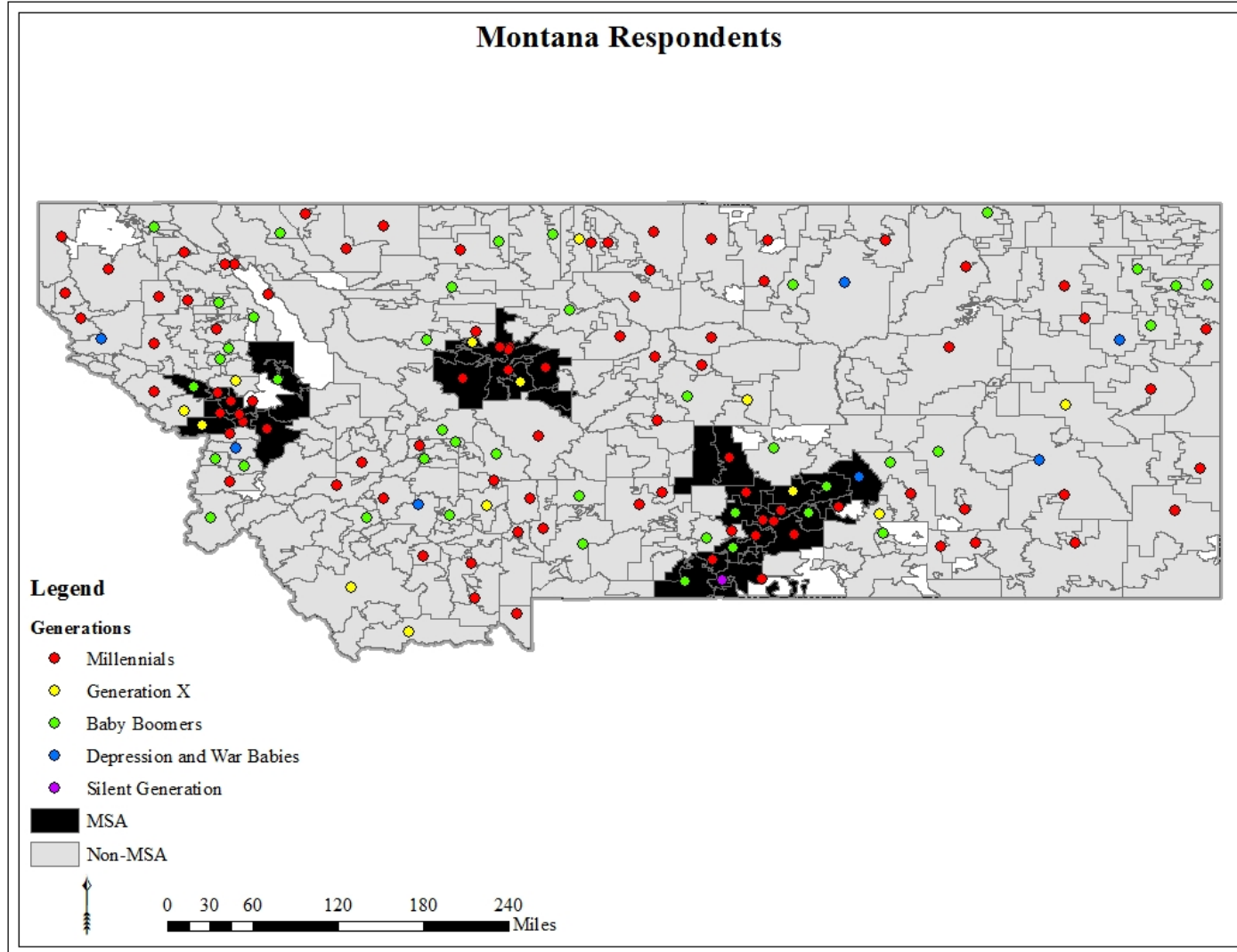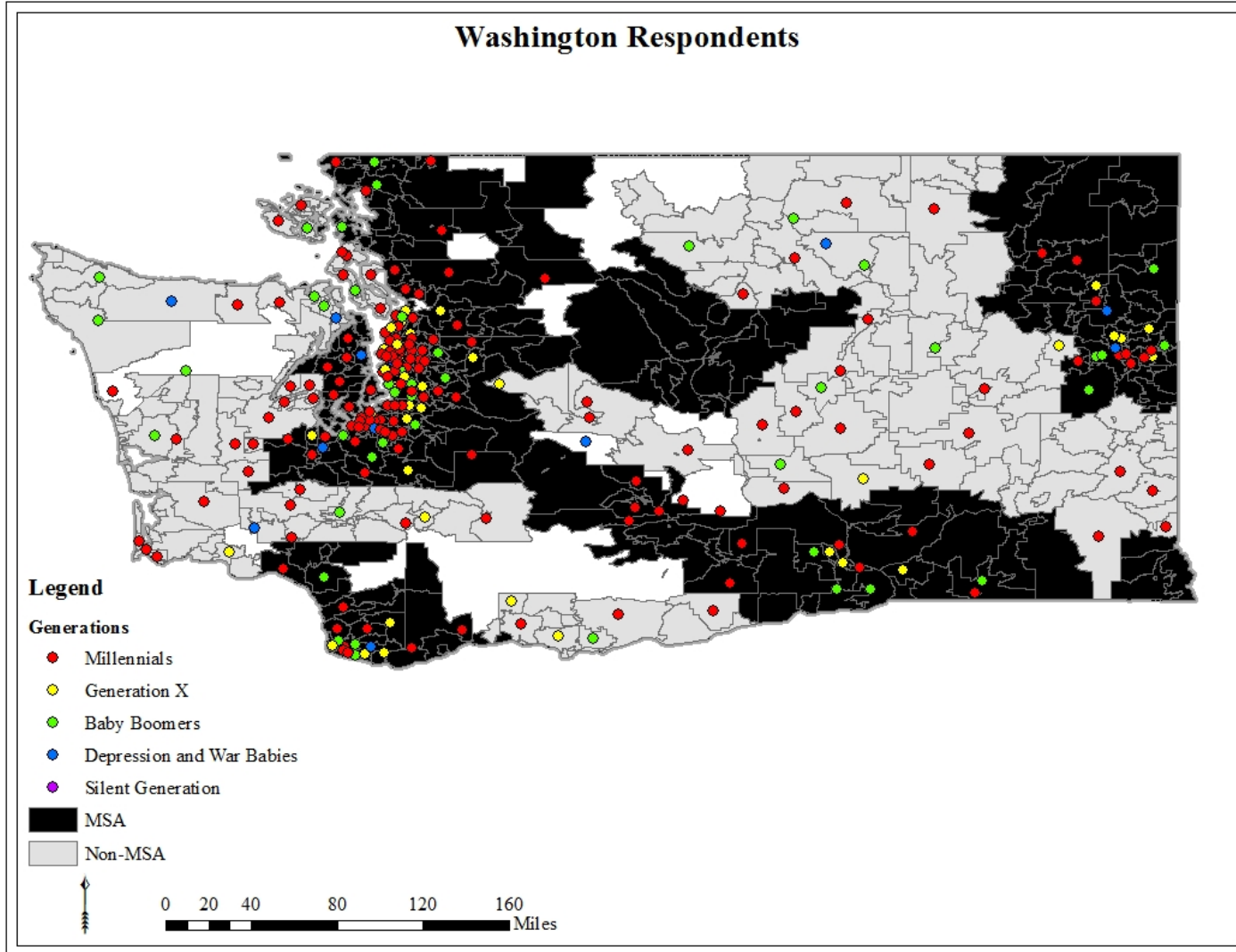
Figure 7: Minnesota Survey Respondents

Figure 8: Montana Survey Respondents
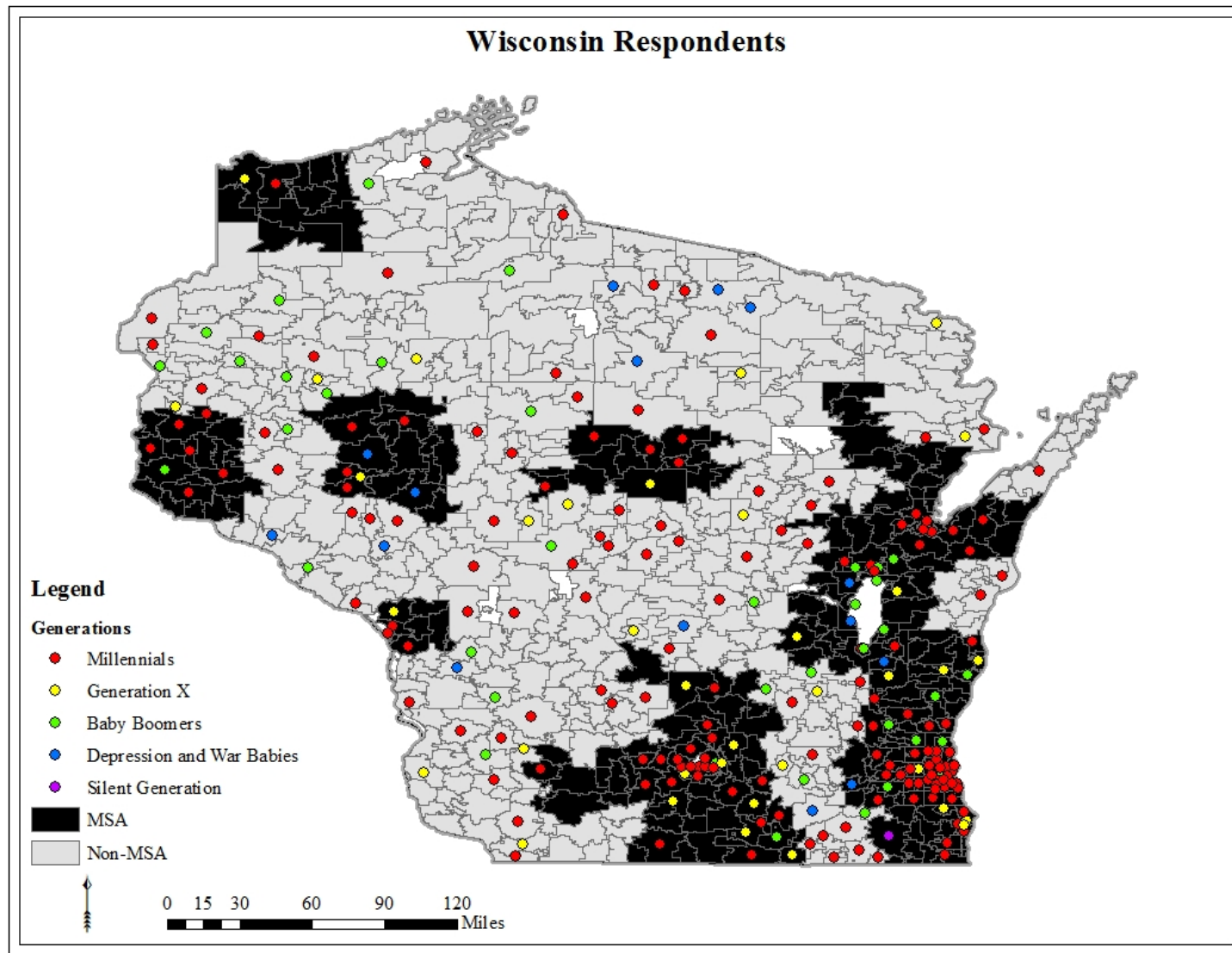
Figure 9: Washington State Survey Respondents

Figure 10: Wisconsin Survey Respondents

Comparing the survey respondents across the states, Minnesota and Washington State seem to exhibit a similar distribution of survey respondents grouped around one major metropolitan area (Seattle and Minneapolis/St. Paul) (Figure 7 & Figure 9). In contrast, Montana survey respondents appear pretty well distributed (Figure 8). However, as the data will show, the survey respondents self-identified that they live in smaller metropolitan areas. This is a subjective measure of urban vs. rural, although it seems as accurate, if not more accurate, than a MSA/non-MSA classification, as discussed previously. Although Madison and Milwaukee are relatively large, Wisconsin does not have quite the large dominating metropolitan area and surrounding suburbs that Minnesota and Washington State do (Figure 10). As such, the representation of urban and rural in Wisconsin appears to be somewhere between Minnesota/Washington and Montana.

5.2.4 Gender

Considering all of the data points, a large majority of survey respondents identified themselves as women, with a 63% to 37% split. Hence, the population obtained for this research project is biased towards responses from women as compared with the entire U.S. population where women represent 50.9% (56).

5.2.5 Racial Identity & Ethnicity

Table 15 presents the percentage of each racial group in the overall sample, the Millennial sample, and across the nation.

Table 15: Racial Representation of Overall Sample, Millennial Sample, and National Representation

Racial Identity	Overall Sample	Millennial Sample	National Representation
American Indian/Alaska Native	4.1%	4.8%	0.9%
Asian	2.9%	3.8%	5%
Black/African American	3.2%	4.2%	13%
Native Hawaiian or other Pacific Islander	0.7%	0.9%	0.2%
White/Caucasian	84.5%	81.7%	72%

Table 15 shows that for the American Indian/Alaska Native and Native Hawaiian or other Pacific Islander racial groups, the sample obtained is slightly larger than the national average. Furthermore, the Millennial sample, likely in part because of the greater propensity for this generation to be multi-racial and also as a reflection of the higher sample size, shows a larger non-White/Caucasian sample size.   However, as a whole, the sample is predominately White/Caucasian. This needs to be taken into account when considering the outcomes. For example, Lachman and Brett (2) reported a greater interest by Hispanic and Black/African American respondents for walkability.

In addition, the overall data set had just 5.4% of the survey respondents identifying ethnically as Hispanic/Latino, with only a slightly higher representation in the Millennial sample at 7.3%. At the national level, approximately 17.6% of the population identifies as Hispanic/Latino (57).

5.2.6 Level of Educational Attainment

The Millennial generation is said to be one of the most educated generations ((29), (44)). The current time period is called the "Information Age;" therefore, it is no surprise that obtaining a high level of education is valued.

Millennials responding to this survey ranged in age from 18 to 32. Therefore, some may be in the process of completing higher levels of education. However, looking at the data for this study which represents both Millennials in urban and rural areas, the Millennial generation does not seem to be more educated than the other generations. In fact, there is a larger representation by the Millennial generation in the "8th Grade" and "Some High School" categories when compared with Generation X and the Baby Boomer generations. Note, however, that the sample sizes for the latter two generations were smaller than the one for the Millennial generation.
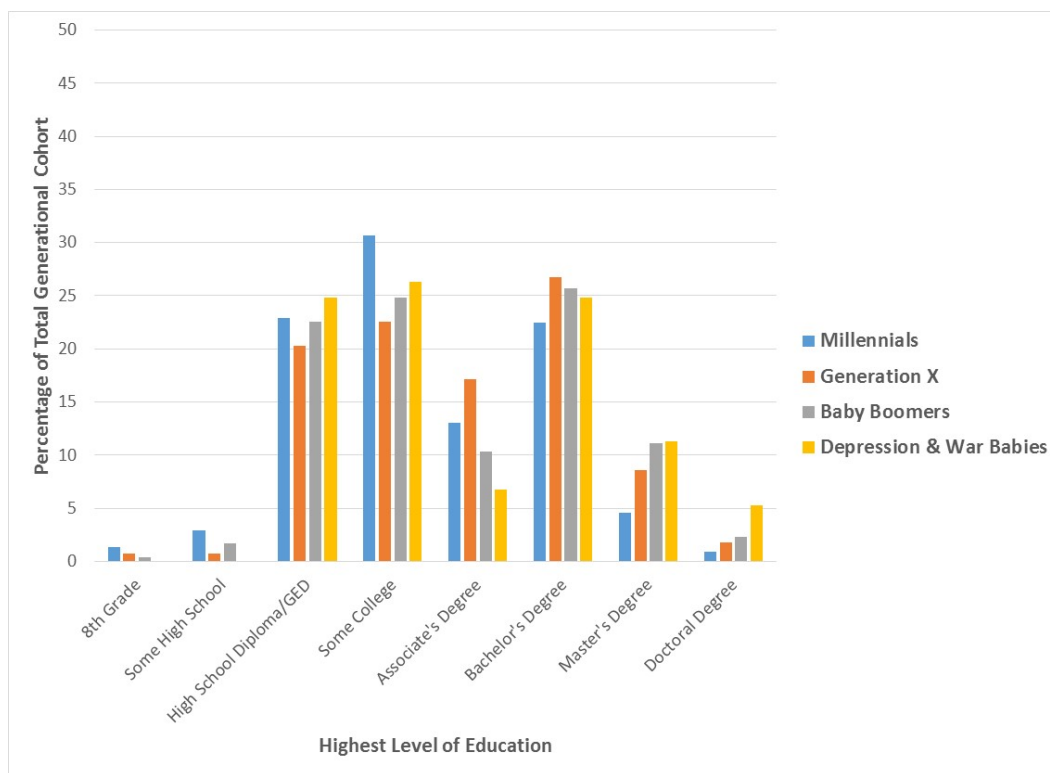
Figure 11: Percentage of Survey Respondents Highest Level of Educational Attainment by Generation

It may not be surprising that some Millennial respondents chose the "Some High School" category, as 18 year old respondents have the potential to choose this option. However, the "8th Grade" percentage is greater for Millennials as compared with other generations. In addition, while some of the "Some College" category may end up switching to the "Bachelor's Degree" category as they complete the degree, it is interesting to note that the "Master's Degree" and "Doctoral Degree"

categories have significantly smaller percentages for Millennials as compared to the other generations. It is possible that some of those who have completed their "Bachelor's Degrees" may then switch categories; however, even if some of the respondents from "Some College" then switch to the "Bachelor's Degree" category, it appears as if the Millennials are no more educated than the other generations. Therefore, either the data sample only captured highly educated survey respondents for Generation X, Baby Boomers and Depression & War Babies, or the Millennial generation as a whole is not as highly educated as other studies report when including Millennials living in rural areas. It could instead be that those living in *urban* areas have a *higher* level of education as compared to those living in rural areas. The real question then becomes, do Millennials in urban areas have a higher level of educational attainment than those in rural areas? In the past, the ability to obtain a job in industry was often associated with a good paying job that did not require much if any education beyond high school. Many individuals in these positions constituted the "Middle Class." In addition, many employers of industrial jobs provided job training as needed. With a large amount of industry being sent overseas, these jobs are no longer available, thereby reducing the Middle Class. Now, there can be a limited number of good paying jobs unless the person attains a higher level of education. The Middle Class is said to be a thing of the past as a result of the lack of industrial jobs in today's society, and the results of this study seem to support that perception.

Looking only at the Millennial data, Figure 12 shows that the majority of respondents currently have achieved "Some College" or a higher level of education. (Note: urban and rural discussed below are defined by the survey respondent, as shown in Table 12.) It is interesting to note that the proportion of Millennials in rural as compared with urban areas who have achieved a high school level of education is almost opposite of the proportion that achieved a "Bachelor's Degree." This would imply that living in an urban environment allows, or maybe requires, a Millennial to achieve a higher level of education. In addition, a higher proportion of Millennials in rural areas have achieved an "Associate's Degree" as compared with those in urban areas.
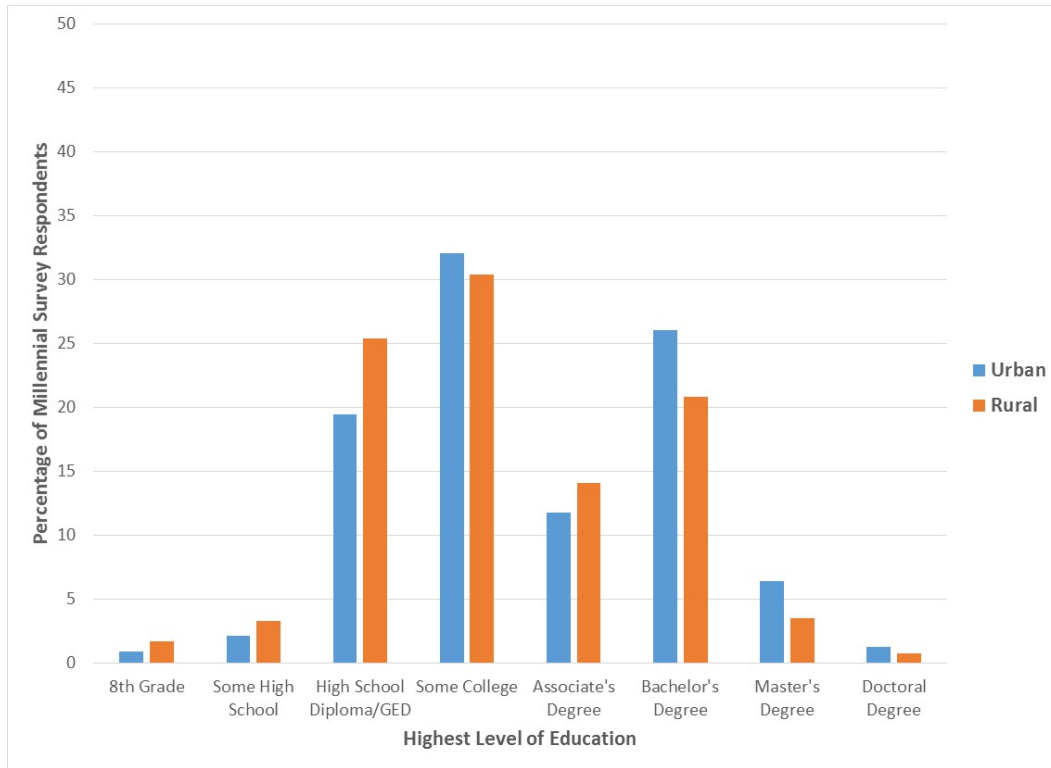
Figure 12: Urban and Rural Millennials by Level of Educational Attainment

Figure 13 shows the indicated highest level of education for Millennials by state. Recall that since the counts for the number of survey respondents by state are approximately equal, there is not a need to show the results in terms of the total number of counts from each state.
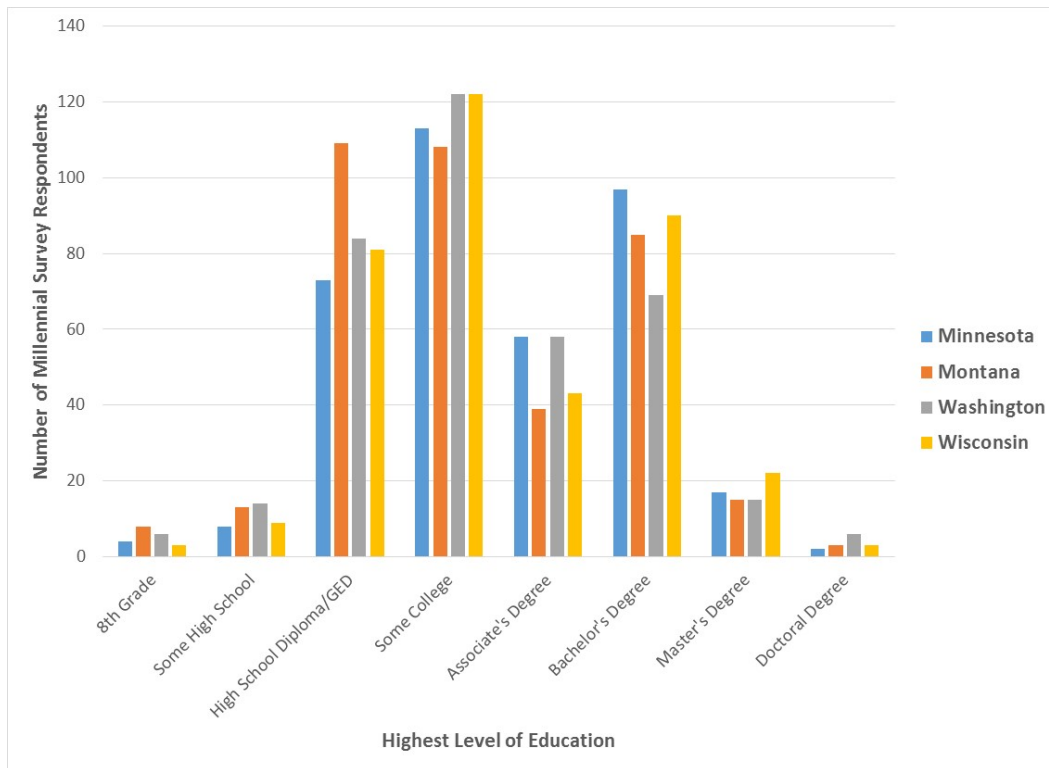
**Figure 13: Millennial Level of Educational Attainment by State**

There are a few interesting things to note from Figure 13. First, the states of Montana and Washington have higher numbers of respondents who have stopped their education at "8th Grade" and "Some High School." Again, for "Some High School," it is possible that these respondents are finishing school. The results consistently show that residents of rural areas seem to have a lower level of education; whether or not that is representative of access or the need for the types of employment is another discussion. Another interesting aspect to note is the high number of respondents from Montana who indicated that they achieved a "High School Diploma/GED." Interestingly enough, the other higher education level categories typically have a lower number of respondents for Montana when compared with most of the other states. This could indicate that to live in Montana, based on the data thus far, either access, the need, or the encouragement to obtain higher levels of education is not as prevalent as compared with other states. Two explanations can be provided to potentially explain this difference. First, when compared with the other states, Montana is clearly more rural in nature. In addition, as shown in Section 5.13, the Montana data is not as clustered around a large city within the state like it is in particular for Minnesota and Washington. However, again, as compared with the other states, Montana does not have a dominating metropolitan area.

5.2.7 Student Loans

A larger percentage of Millennial survey respondents reported having student loans when compared with Generation X and Baby Boomers, particularly in the $20,000 to $49,999 category (Figure 14 & Figure 15). This is expected as Generation X, and in particular, Baby Boomers would be expected to have paid off their student loans by this point in their life cycle.
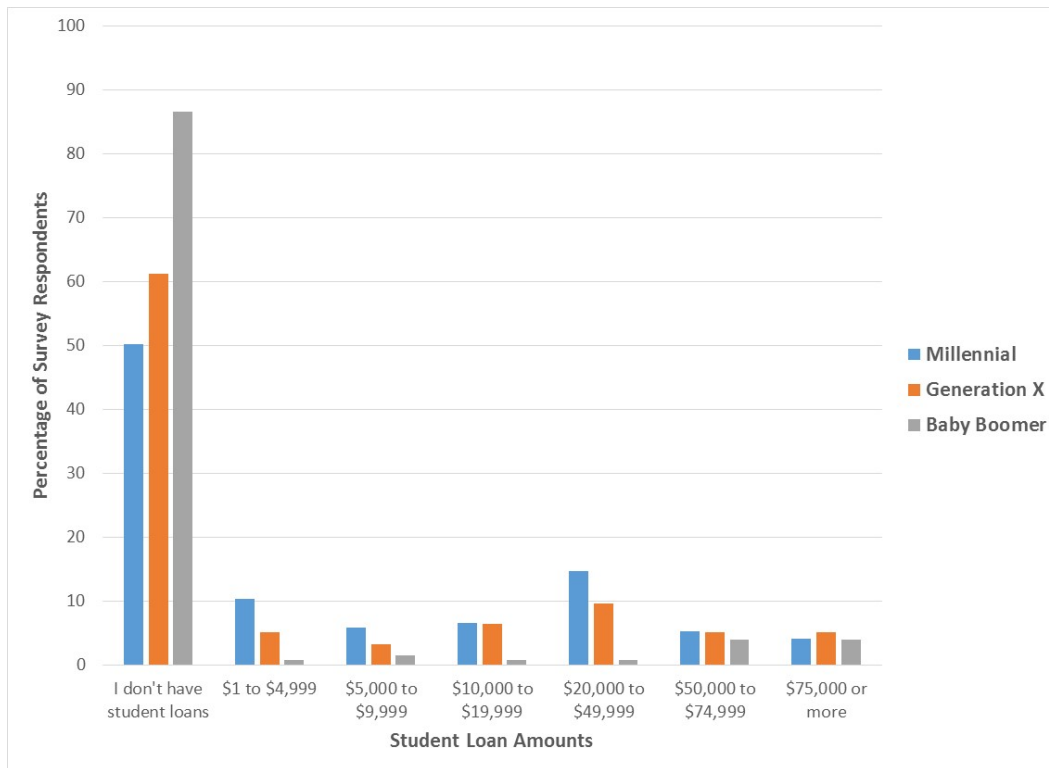
Figure 14: Percentage of Urban Survey Respondents with Student Loans by Generation
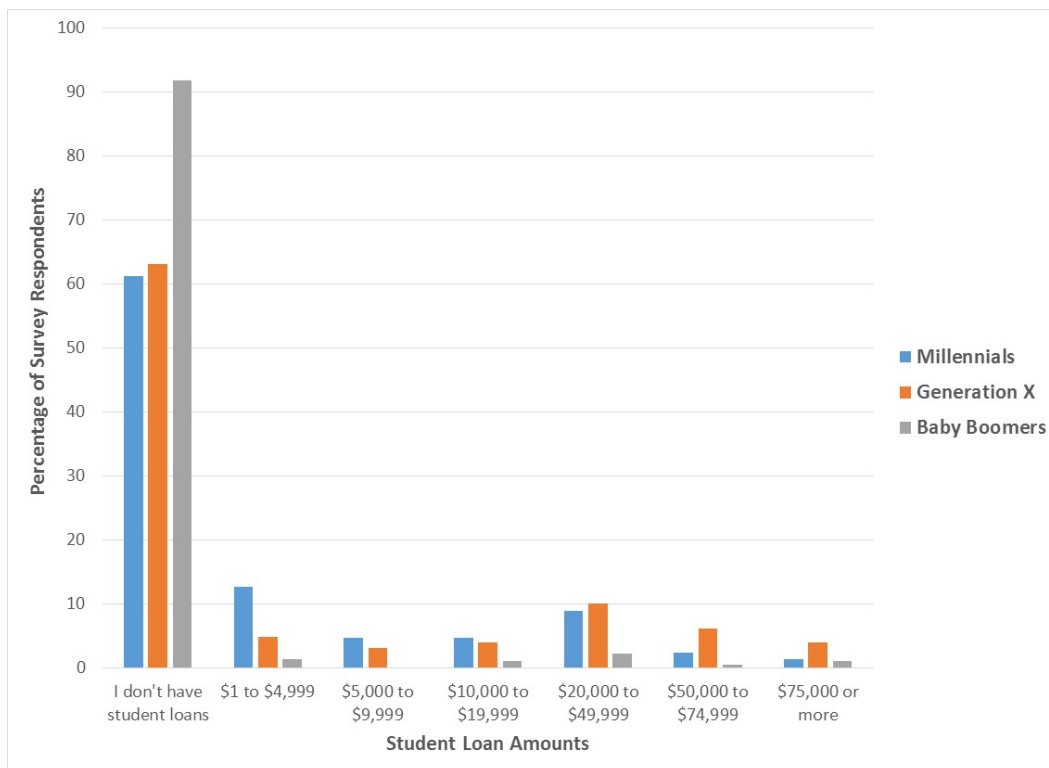
Figure 15: Percentage of Rural Survey Respondents with Student Loans by Generation

In addition, just over 10% more Millennials in rural areas reported not having any student loans as compared with their urban counterparts, and more rural Millennials reported having smaller amounts of student loans ($1 to $4,999) as compared to their urban counterparts (Figure 16). In contrast, for all of the larger student loan categories ($5,000 to $9,999; $10,000 to $19,999; $20,000 to $49,999; $50,000 to $74,999; and $75,000 or more), there was always a higher percentage of urban Millennial survey respondents.
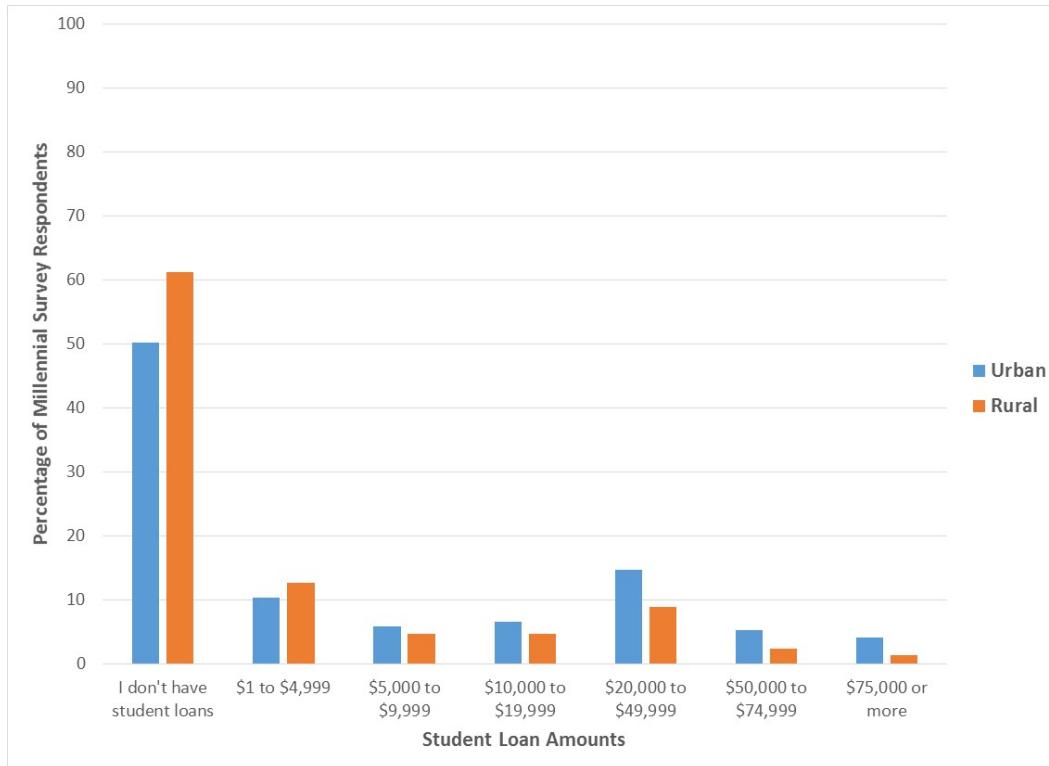
Figure 16: Percentage of Millennials with Student Loans, Urban vs. Rural

5.2.8 Household Income

Survey respondents were asked to report their household income. Table 16 shows the reported categories of income for urban and rural areas across generations.

Table 16: Urban vs. Rural Annual Household Income

Urban	Rural

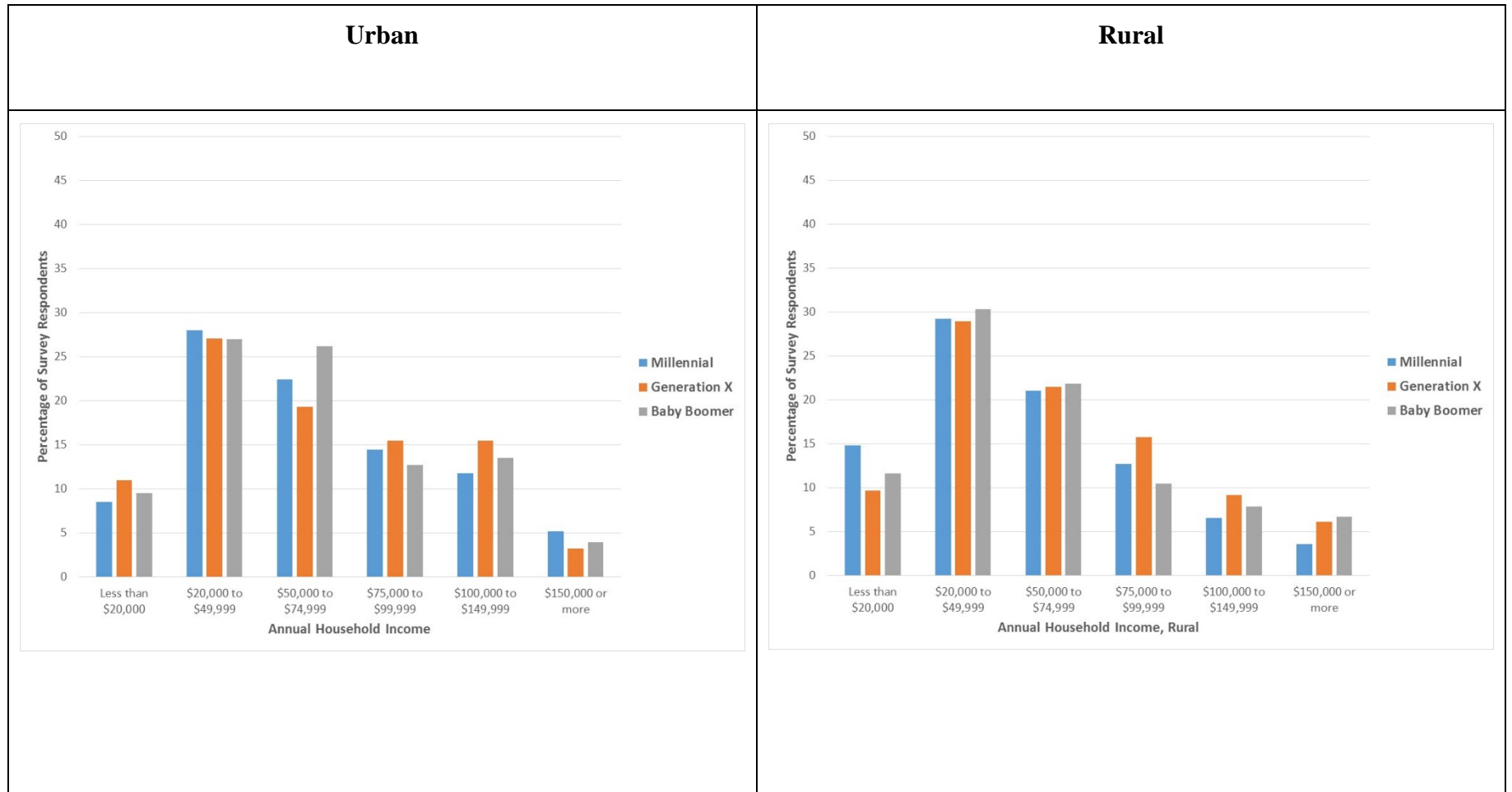It shows that the majority of respondents fall into two income categories, "$20,000 to $49,999" and "50,000 to $74,999" in both urban and rural areas. In general, there appears to be a curve with the largest portion represented by these two income categories in both rural and urban environments. However, the exception are Millennials in rural areas who earn "Less than $20,000." There is more representation in this income category, which exceeds the general trend for the rural area. It also appears that those Millennials who are earning the most are living in urban areas, as the proportion of Millennials earning $150,000 or more exceeded the other generational cohorts in earning.

The research team took a more in-depth look at the locations of Millennials who earned less than $20,000, both in urban and rural areas, using the provided zip code.

Figure 17 shows that the majority of Millennial respondents earning less than $20,000 live in non-MSA areas. However, the states of Montana and Washington have a greater number of Millennials falling within this category who live in MSA areas.
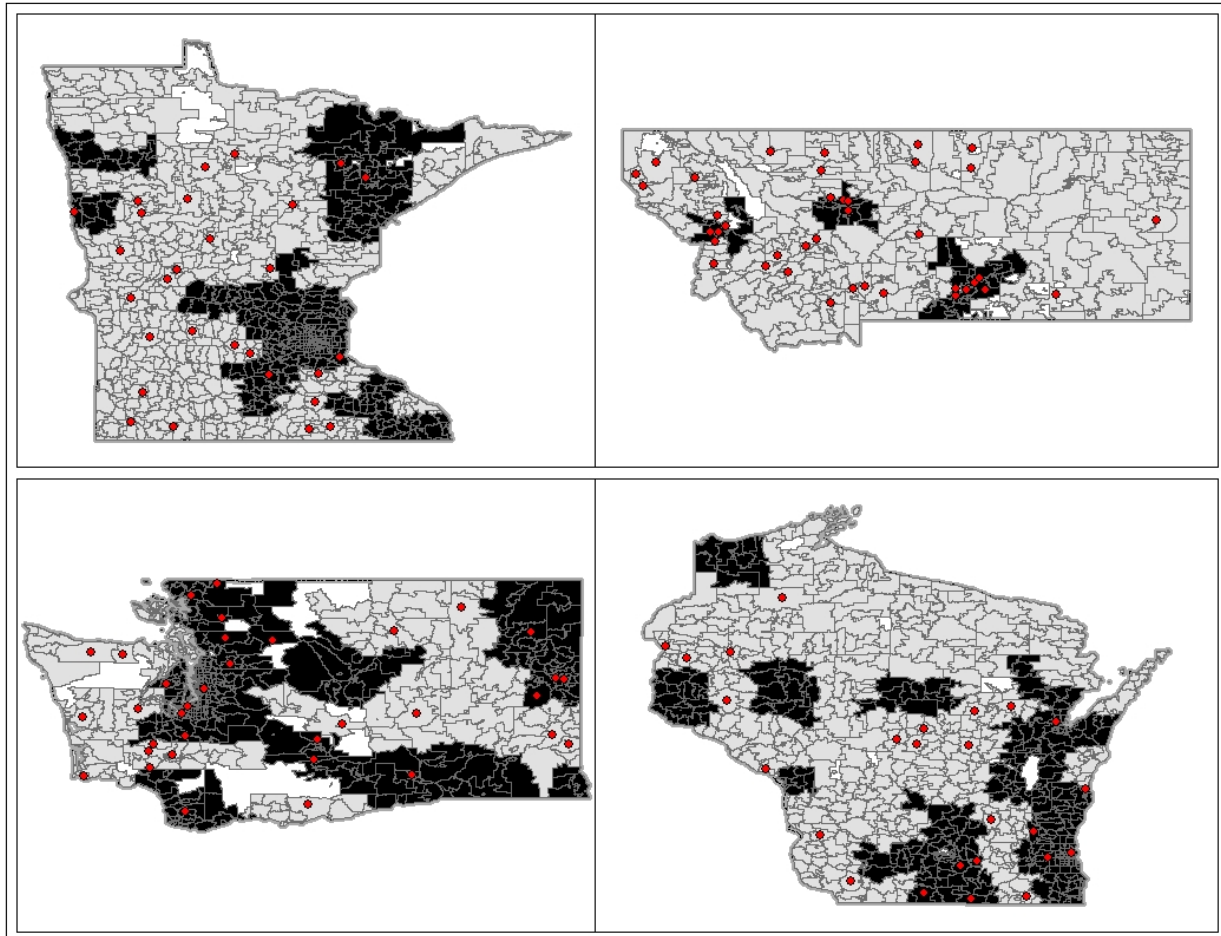
Figure 17: Location of Millennials Earning Less Than $20,000

5.3   Transportation

Eleven of the sixty questions from the survey were categorized within the transportation category. They are: 1) travel information, 2) transportation modes used in a typical week, 3) preferred transportation modes for work, school and recreation trips, 4) public transportation – factor in current residence, appeal, timeliness, 5) bicycle – factor in current residence, proximity to leisure bicycling, need for more facilities, 6) need for more public transportation, 7) open answer question regarding need for more public transportation, 8) need for more bicycling facilities, 9) open answer question regarding need for more bicycling facilities, 10) need for more sidewalks, and 11) open answer question regarding need for more sidewalks. The following sections present the most important findings for these questions; additional details can be found in *Mobility Mindset of Millennials in Small Urban and Rural Areas: Technical Memorandum, Survey Findings – Transportation* (54).

5.3.1 Travel Information

Considering all types of travel information sources used by Millennials, Generation X and Baby Boomers, it appears that Millennials and Generation X prefer emerging, dynamic technologies (smartphone) whereas Baby Boomers tended to prefer more static, less interactive technologies (desktop/laptop, standalone GPS, TV). Figure 18 shows that the smartphone is the most popular travel information source for the Millennial and Generation X generations. Baby Boomers reported a desktop/laptop as their preferred source for travel information.
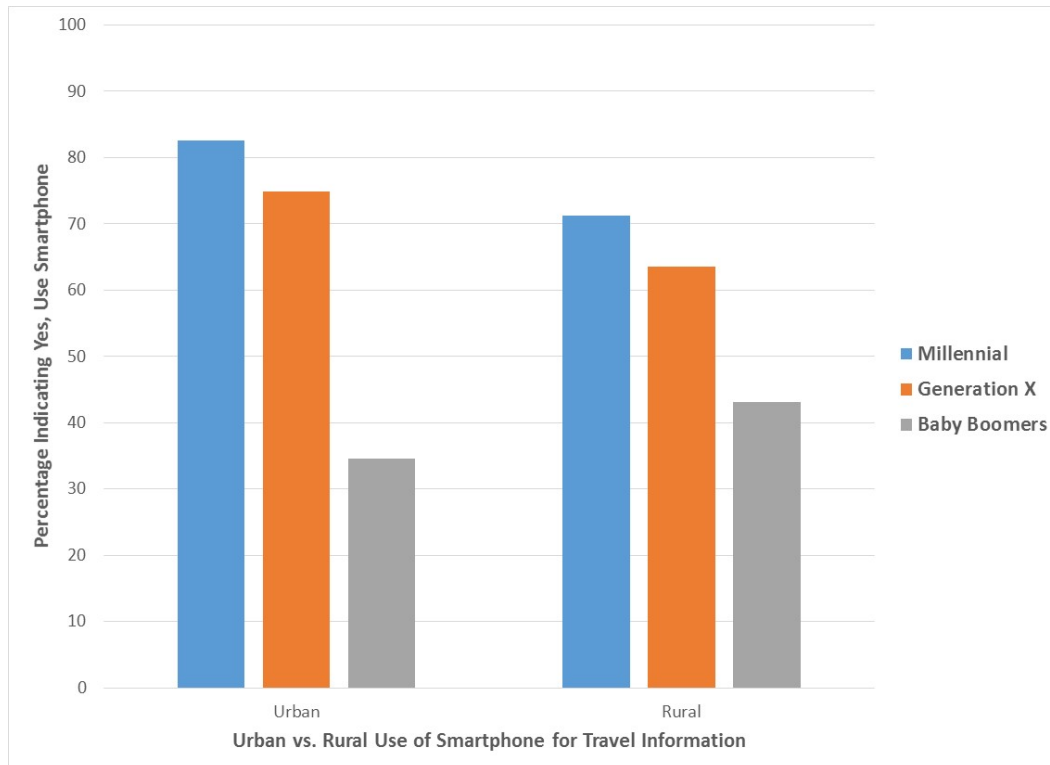
Figure 18: Urban vs. Rural Use of Smartphone for Travel Information by Generations

511 and DOT social media were reported as two of the least used travel information sources by all generational cohorts. However, there are clear benefits to a DOT in being able to use such a source for emergency information dissemination, as was done during Hurricane Sandy (52). While Twitter was not reported as a heavily utilized source within the survey results for this study, it would be of interest to include a state like New York in a future study, to identify if the reported Twitter use would be different, particularly after events like Hurricane Sandy may have potentially motivated non-social media users to adopt them. The results from this study could potentially reflect the rapidly changing interest in social media platforms. To further incentivize the younger generation to use their social media, a DOT might want to consider Row's (51) recommendations by creating rewards, badges and acknowledgements to engage them.

5.3.2 Transportation, Typical Week

Figure 19 through Figure 21 show the reported modes of transportation used by a survey respondent for each successive generation in a typical week (Note: Each survey respondent may choose more than one mode). The figures show that Millennials reported using a wider variety of modes. The figures also show that the adoption of emerging mode options (e.g., Rideshare, Carshare), in general, decreases with the older generational cohorts. This result is consistent with a *Washington Post* article, which was based on a more recent Pew Research Center report indicating that "young, well-educated, well-off and urban" are descriptors for the most frequent Uber and Lyft users (58). Finally, the figures show that regardless of generation, there is more of a dependency on the automobile reported by rural survey respondents when compared with their urban counterparts. Yet, when comparing modes, the automobile is still the preferred mode; similar findings were concluded by Lachman and Brett (2), even when survey respondents of that study indicated a preference for walkability.
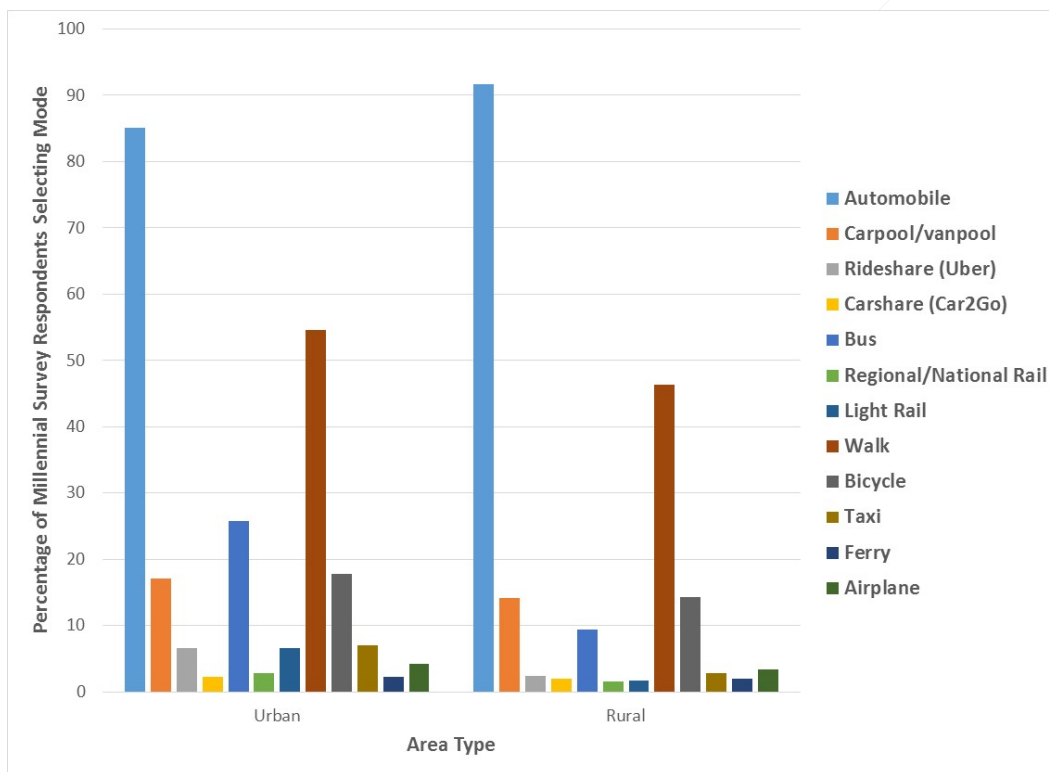
Figure 19: Urban and Rural <u>Millennials</u>, Typical Transportation Modes Used in a Week
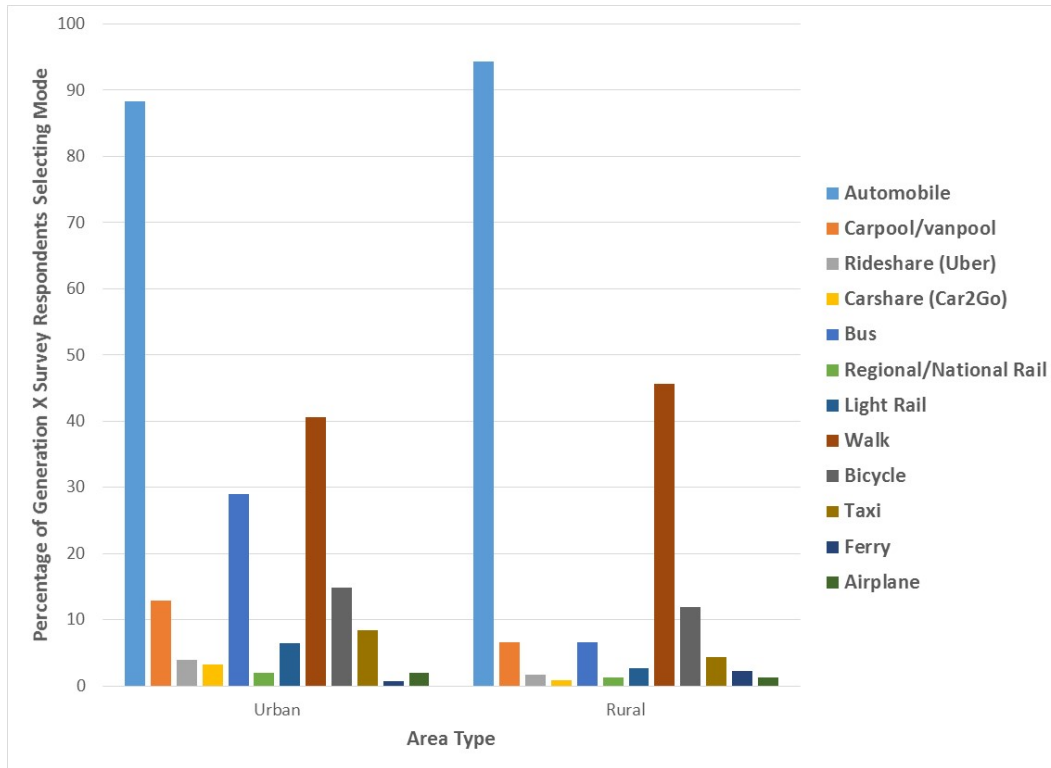
Figure 20: Urban and Rural <u>Generation X</u>, Typical Transportation Modes Used in a Week
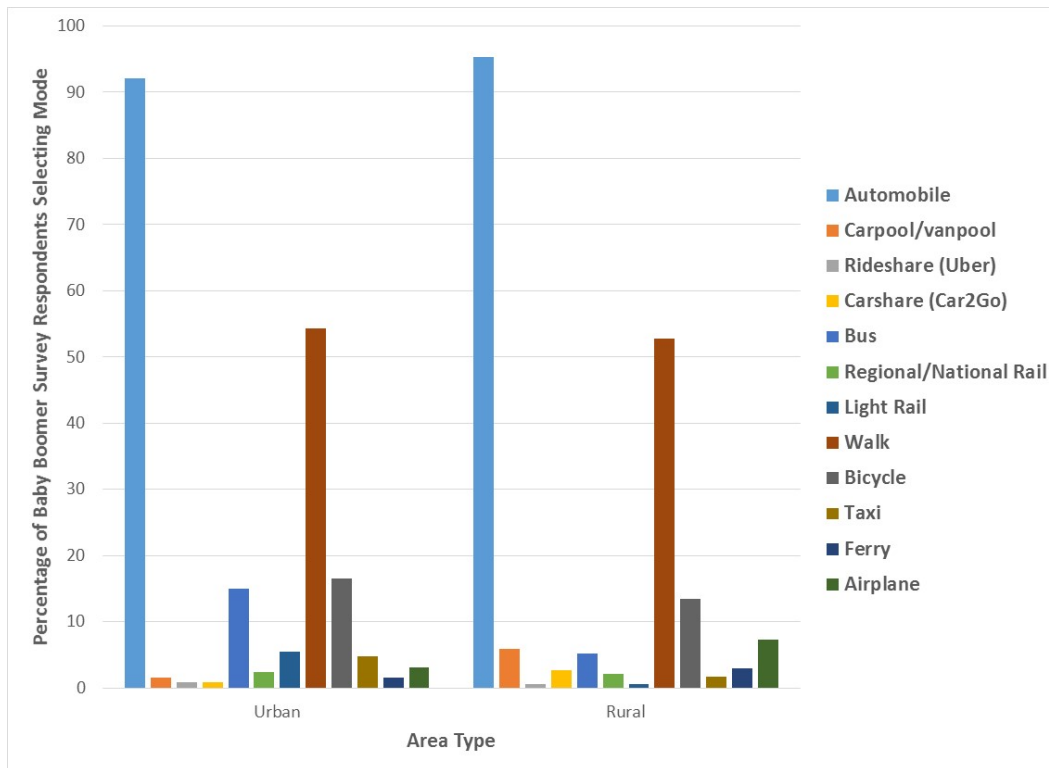
Figure 21: Urban and Rural <u>Baby Boomers</u>, Typical Transportation Modes Used in a Week

5.3.3 Preferred Mode of Transportation

In addition to asking survey respondents what type of transportation they took in a typical week, survey respondents were asked to identify the mode of transportation that they would prefer for 1) work, 2) shopping and 3) recreation. A survey respondent was only allowed to choose one mode for each trip type.

For a work trip, of the three generations, Baby Boomers had the most consistent responses between the urban and rural respondents within their generation with almost the same percentage of each choosing automobile, possibly reflecting fewer demands that this generation faces at this point in their life cycle along with potentially reflecting those that have already retired (Figure 24). This finding is in contrast with the Millennials and Generation X, where a higher percentage reported preferring an automobile to travel to work (Figure 22 & Figure 23). Interestingly, a larger percentage of Baby Boomers also reported preferring to walk as compared with the younger generational cohorts. This could also reflect the Baby Boomer generation that is still employed having more choice in where they work. Of the three generations, the Millennial generation showed the greatest difference between their urban respondents and the urban respondents of other generations in that these respondents reported a wider variety of transportation modes as their preferred mode to work.
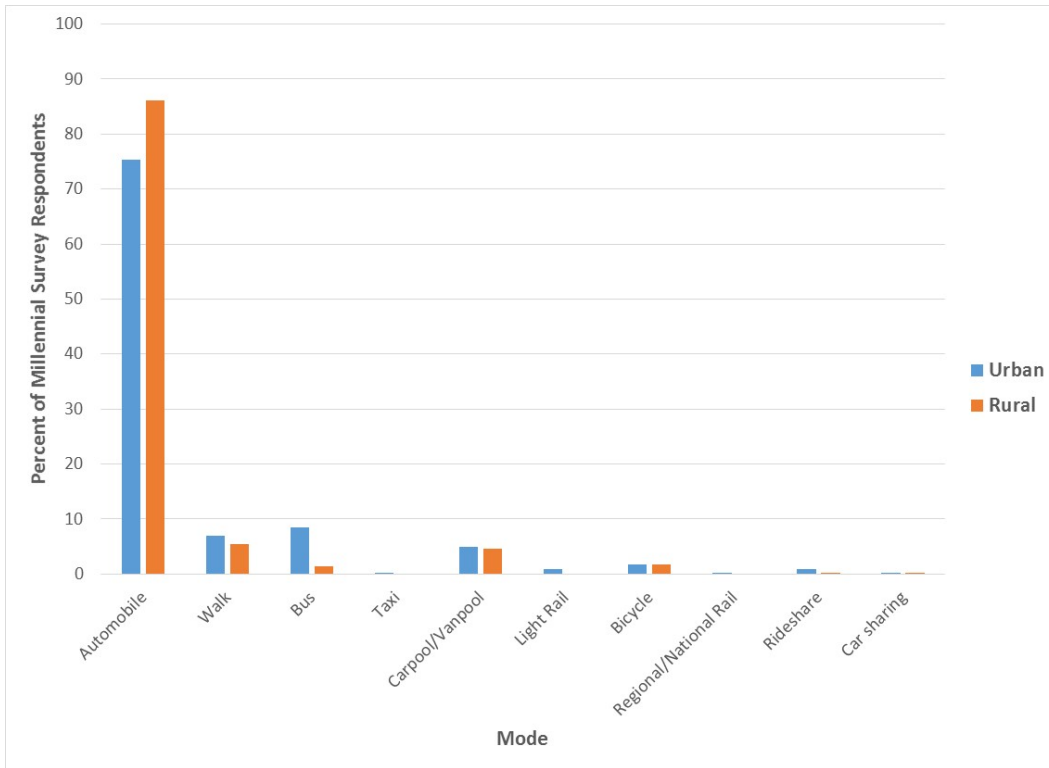
Figure 22: Urban and Rural <u>Millennials</u>, Preferred Mode for Work
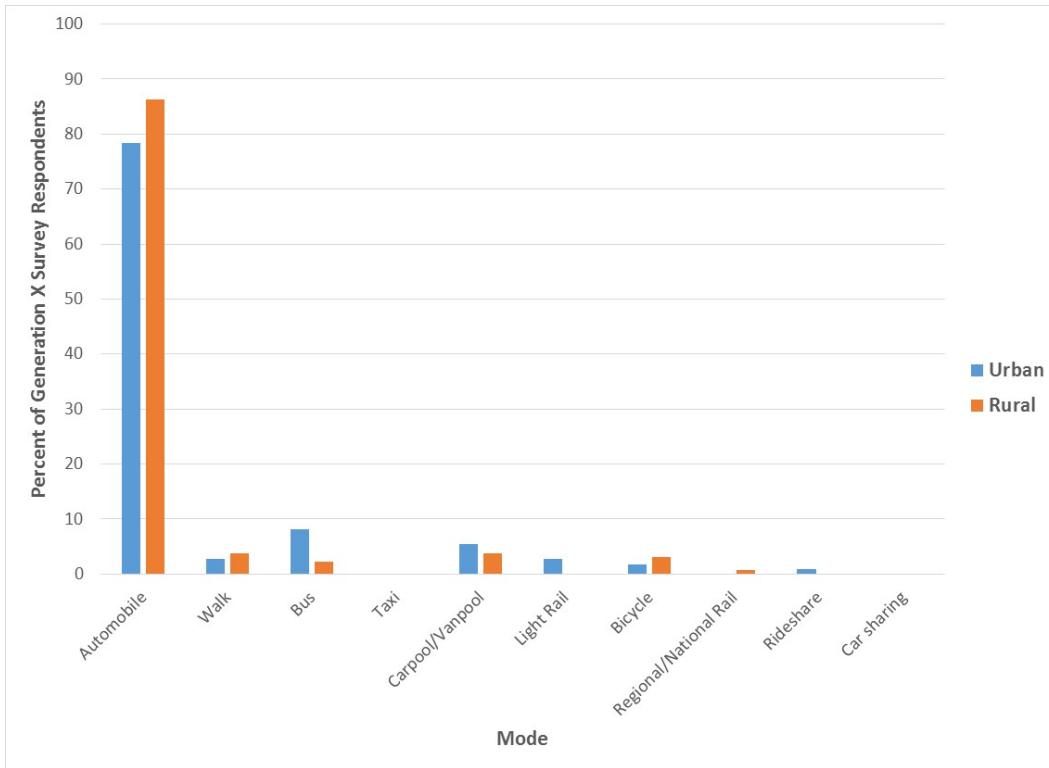
Figure 23: Urban and Rural <u>Generation X</u>, Preferred Mode for Work

Figure 24: Urban and Rural <u>Baby Boomers</u>, Preferred Mode for Work

Only Millennials and Generation X were analyzed for their reported mode of travel for school, as very few Baby Boomers reported being students. Comparing the Millennials to Generation X shows a substantial difference between survey respondents' preferred modes (Figure 25 & Figure 26). Millennials reported preferring a wider variety of modes. In addition, there was a more pronounced difference between Millennials as compared with Generation X survey respondents when comparing the percentage of urban vs. rural survey respondents reporting that they preferred to use an automobile to travel to school.

Figure 25: Urban and Rural Millennials, Preferred Mode for School

Figure 26: Urban and Rural Generation X, Preferred Mode for School

When looking at Figure 22, Figure 23, Figure 25, and Figure 26, it appears that Generation X has more of an interest than Millennials in bicycling for work and school (e.g. utilitarian trips). Millennials, particularly urban Millennials, appear to view bicycling as one of their preferred modes for recreation (Figure 27). Similarly, whereas fewer Millennials appeared to prefer the bus when compared with Generation X for utilitarian modes, when it comes to recreation, a larger percentage of Millennials indicated a preference for the bus when recreating (Figure 22, Figure 23, Figure 25, Figure 26, Figure 27, & Figure 28). When it comes to recreation, both urban and rural Baby Boomers seem to prefer the automobile (Figure 29). In addition, the percentage of both urban and rural Baby Boomers indicating a preference for the automobile for recreation purposes is only slightly less than those indicating a preference for it for work purposes (Figure 24 & Figure 29).
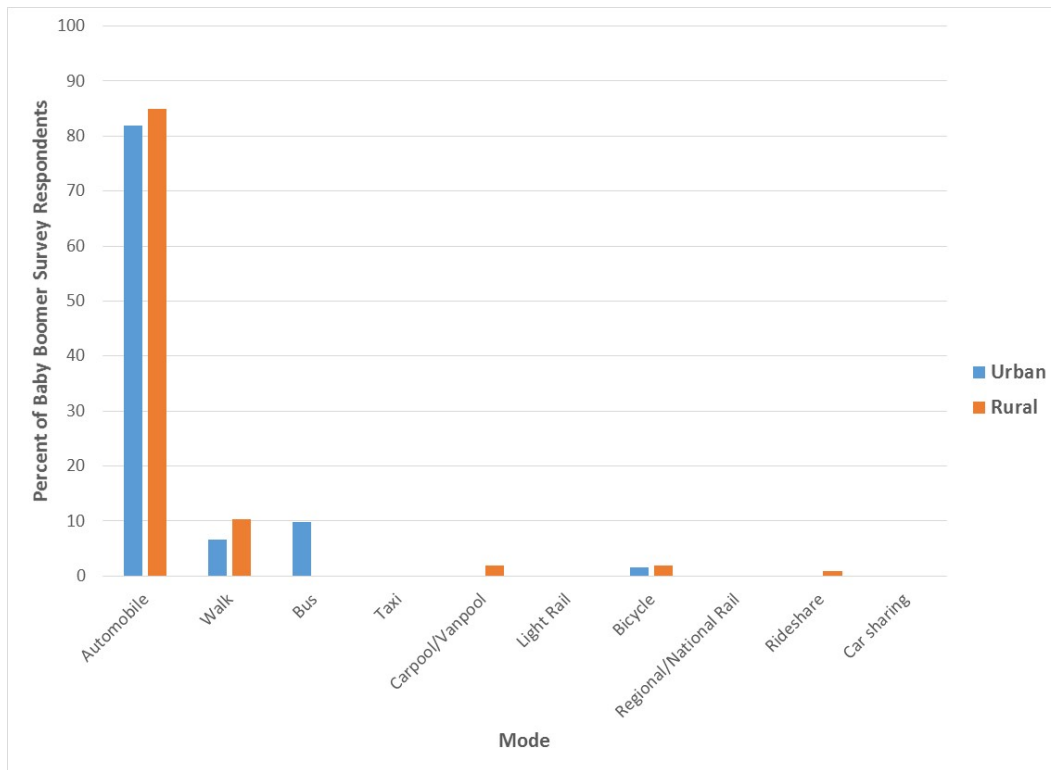

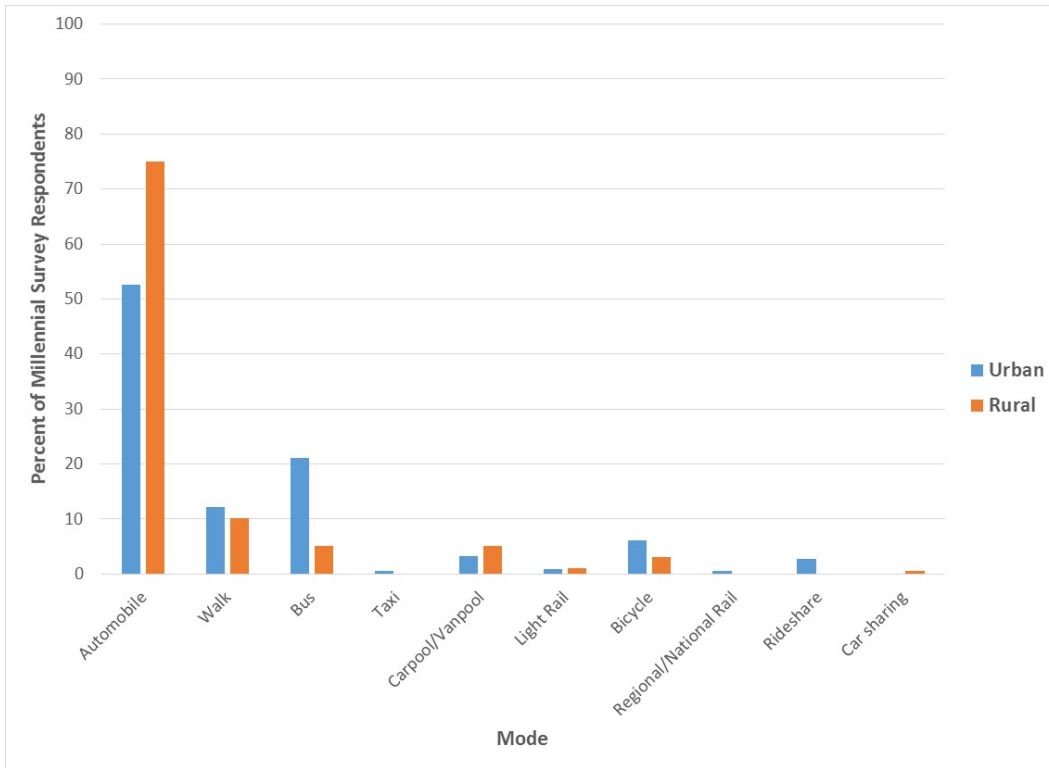**Figure 27: Urban and Rural Millennials, Preferred Mode for Recreation**

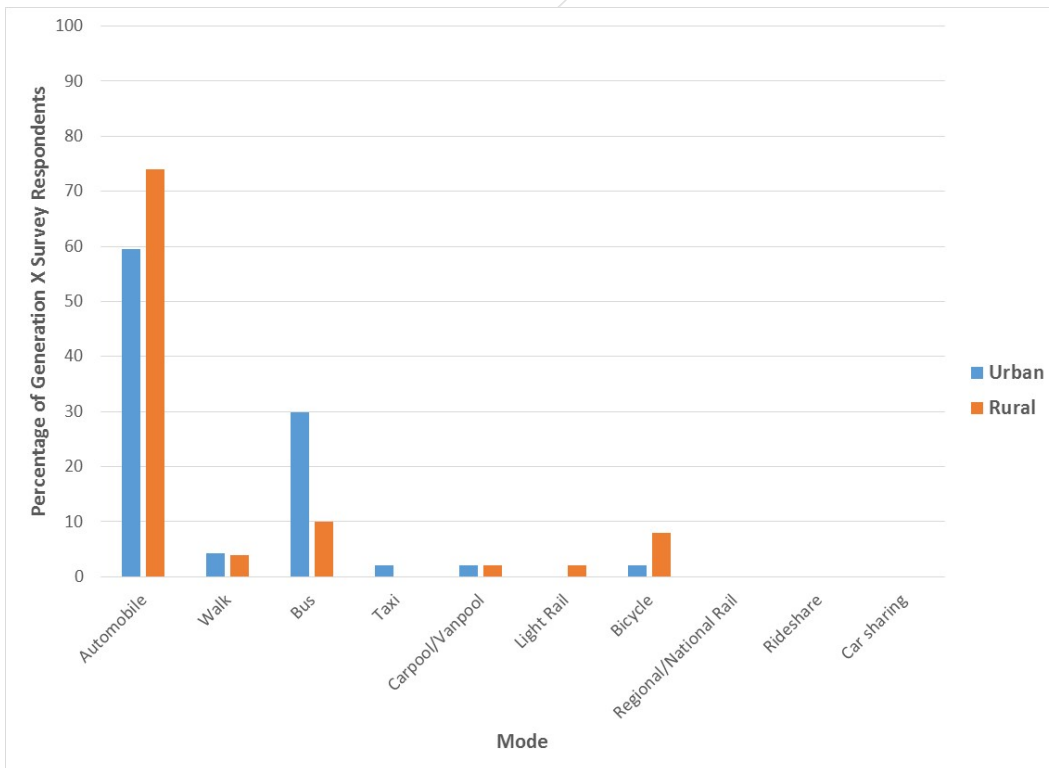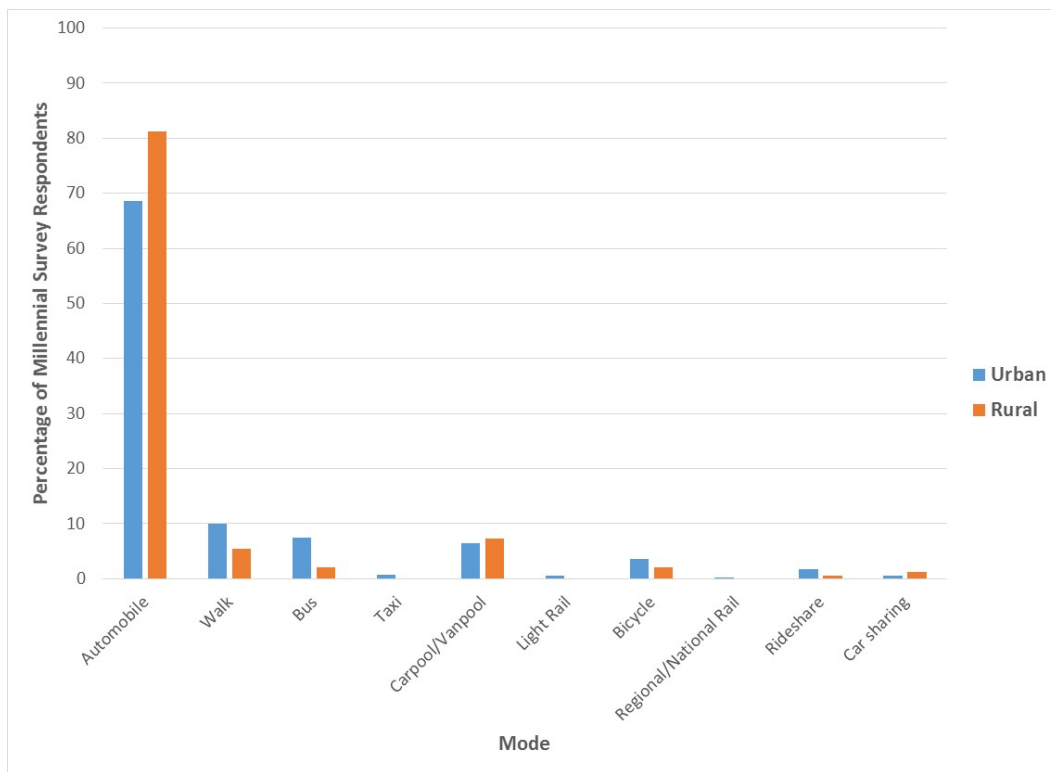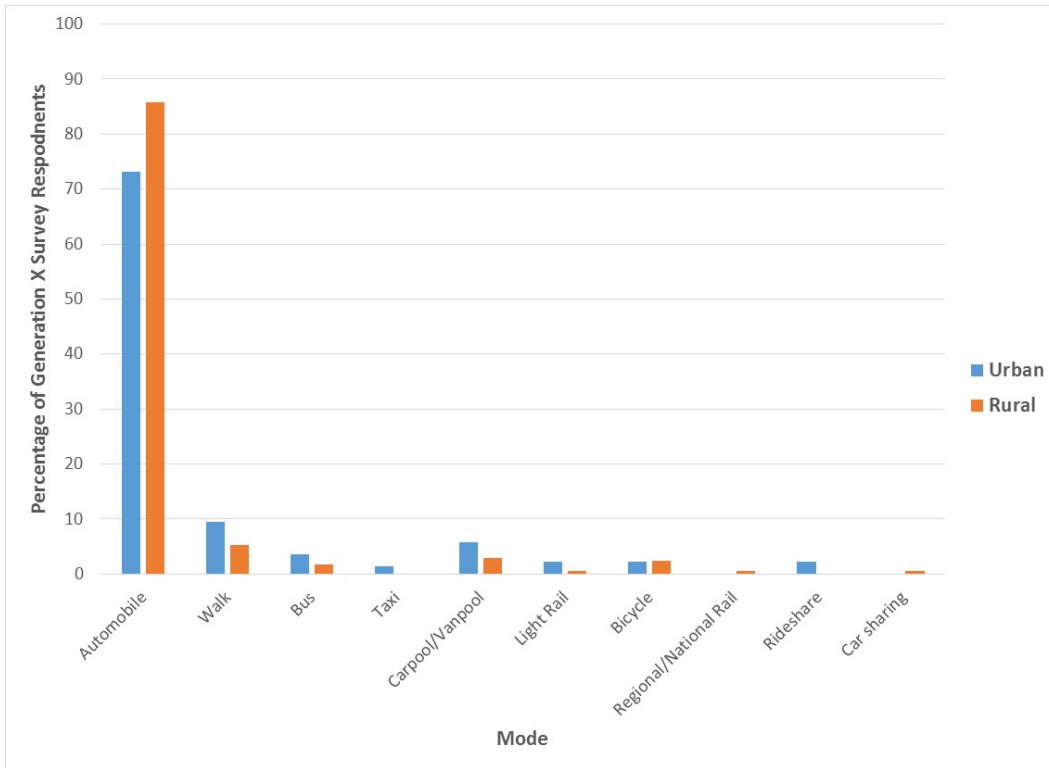**Figure 28: Urban and Rural Generation X, Preferred Mode for Recreation**
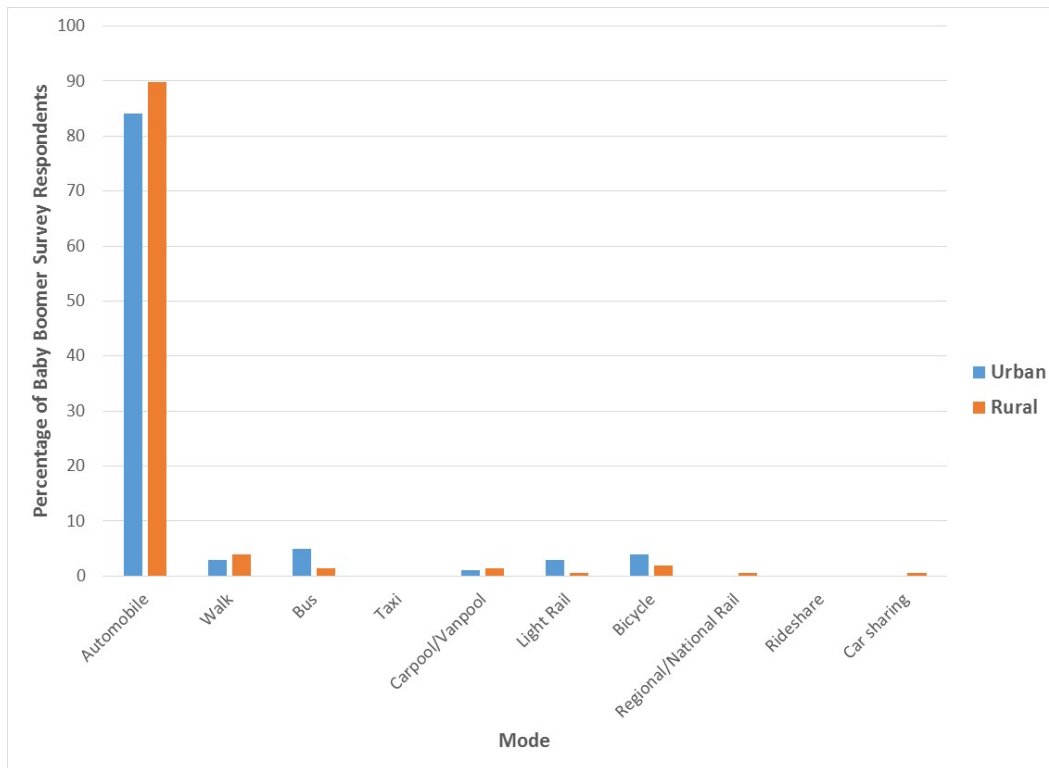
Figure 29: Urban and Rural Baby Boomers, Preferred Mode for Recreation

5.3.4 Public Transportation

Overall, the results show that across generations, both urban and rural, the presence of public transportation does not influence where survey respondents chose to live.

The majority of rural survey respondents across generations reported that public transportation is not appealing where they live. In contrast, across generations, the majority of urban survey respondents indicated that they "Agree" that public transportation presents some appeal where they live. Similar results were found when survey respondents were asked if they are able to get to where they wanted to go using public transportation and their opinion regarding the timeliness of public transportation.

5.3.5 Bike

Similar to the findings for public transportation, the ability to bike for everyday travel and the proximity to leisure bicycling opportunities were not found to influence the choice of where one lives. In contrast, the results were more variable when survey respondents were asked whether where they lived provided them with the opportunity to bike; however, there is still a bias towards disagreement. However, considering that previous questions showed that few survey respondents reported bicycling in an average week, there is likely some bias in that those who do not bike on a regular basis may feel that that bicycle facilities are sufficient. If some life event (e.g. a car crash resulting in the need for their car to be in the shop) would result in them needing to bicycle for a week, these same respondents might have a different opinion.

5.3.6 More Public Transportation, Bicycling and Walking Service Provisions

Overall, survey respondents reported a preference for additional public transportation provisions followed by sidewalks, followed by bicycling facilities. Among Millennials and Generation X, urban survey respondents reported a greater interest in each active transportation mode type (public transportation, bicycling, walking), than rural survey respondents. However, the opposite was true for Baby Boomers. This could potentially reflect that Baby Boomers, as they move towards retirement and the challenges of driving as they age, may be more open to active transportation modes to maintain their independence. When questioned about their valuation of independence, Baby Boomers reported valuing their independence more significantly than other generations.

5.3.7 Transportation Summary

As compared with previous generations, Millennials are using the automobile less. They seem to be making use of technologies that provide better information and more transportation options. However, there is a need to better understand specific differences in preferences between the Millennial generation and Generation X. For example, Generation X appears to have a greater interest in bicycling, particularly in rural areas. Baby Boomers, as a whole, seem to be making use of the technologies that they are comfortable with, which tend to be less dynamic. In addition, those who are not interested in additional alternative transportation provisions seem to indicate that they either do not use them or that they believe there are enough. Their responses hint that they do not see the value in investing money into more bike lanes, bike paths, sidewalks or additional public transportation service.

5.4 Lifestyle

The remaining thirty-nine of the sixty questions from the survey (grouped in the following fourteen sub-sections) were categorized within the lifestyle category. They are: 1) student status, 2) days of travel to school, 3) one-way travel distance to school, 4) employment-related questions like number of days worked, number of days traveled to work, hours worked at a job, distance to travel to place of employment, 5) social media, 6) agreement questions related to connecting to internet, variety of transportation choices, influences of cost on travel, influences of distance on mode choice, online shopping, and walkability, 7) number of vehicles, 8) vehicle ownership status, 9) preference for new technology, sociability, price, technology, valuation of independence, valuation of local/authentic, and environment, 10) household internet, 11) moving status, 12) number in household, 13) number of children in household, and 14) living situation. Highlights of these questions are presented in the following sections. More detailed information can be found in the *Mobility Mindset of Millennials in Small Urban and Rural Areas: Technical Memorandum, Survey Findings – Lifestyle* (55).

5.4.1 Student Status, Days of Travel to School, Distance of Travel to School

Among Millennial survey respondents, 58.7% reported possessing an Associate's Degree or higher or identified themselves as students. This was comparable to the percentage of Generation X survey respondents, where 56.6% of the 385 Generation X survey respondents reported attaining an Associate's Degree or higher or reporting that they are students. In contrast, 49.5% of the Baby Boomer generation and 48.1% of the Depression & War Baby generation reported having an Associate's Degree or higher or reported that they are students. Therefore, as a whole, the

Millennial generation is the most educated generation; however, Generation X is not that different based on the data collected for this study. This could, in part, reflect the variability associated with the definition of the birth years of the Millennial generation. In contrast, the older generations, the Baby Boomers and Depression & War Babies, have a small percentage of their survey respondents reporting an Associate's Degree or higher or who identified themselves as students.

In general, a higher percentage of urban Millennials indicated that they were students when compared with their rural counterparts. Washington State was the only exception; the percentage of urban Millennial survey respondents in Washington State was smaller when compared with the other three states. The lowest percentage of Millennial survey respondents indicating that they are students was reported by rural Millennials in Montana. Considering only Millennials that reported taking courses online, on average 66% lived in rural area types whereas 32% lived in urban area types. For those respondents who traveled to school, urban Millennial survey respondents tended to report living in close proximity (less than or equal to 10 miles) to their educational institution. Urban Millennials also indicated a preference for walking to school, which is consistent with the findings by Kamargianni and Polydoropoulou (27) where a large percentage of students who lived in close proximity to school chose to walk. In contrast, Millennial survey respondents in rural areas typically reported living within more medium distances (5 to 10 miles, 10 to 15 miles).

Just over ninety-one percent of Generation X survey respondents indicated that they were *not* students. More Generation X survey respondents who indicated that they were students reported taking courses online as compared with Millennials (Figure 30).
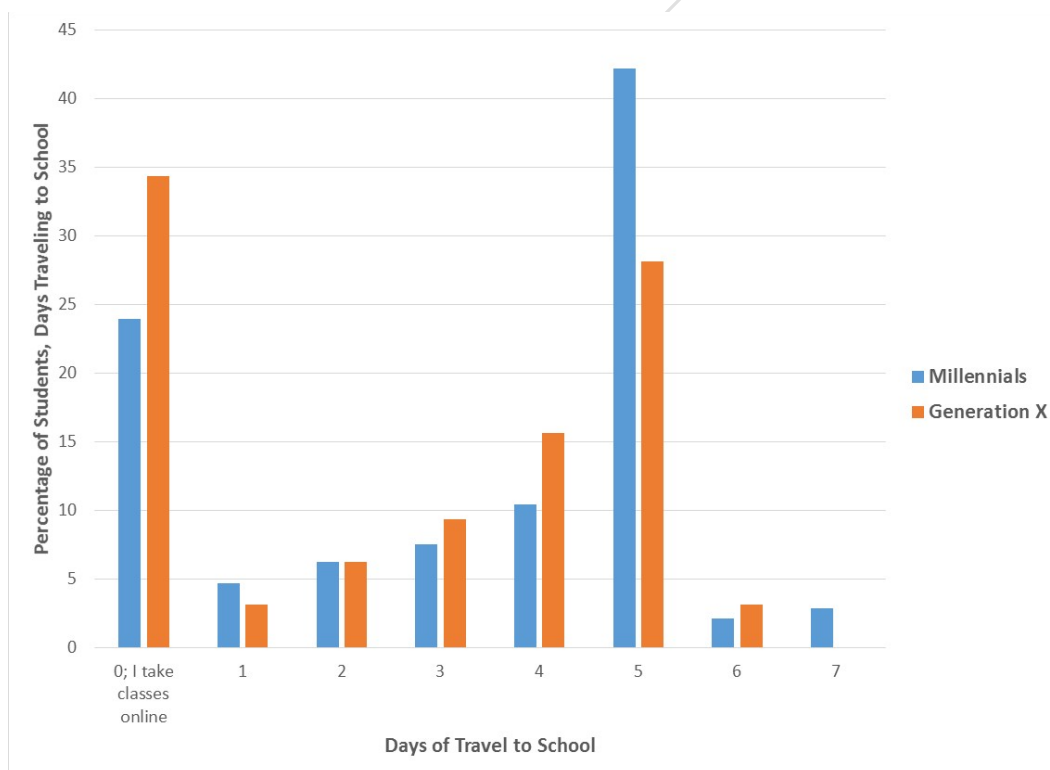
Figure 30: Days of Travel to School, Percentage of Millennials & Generation X

In addition, fewer Generation X survey respondents reported being 5-day-a-week students as compared with Millennials, potentially hinting that they tend to *not* be full-time students. Most Generation X students reported traveling 10 to 15 miles to attend school.

Finally, approximately ninety-nine percent of Baby Boomer survey respondents indicated that they were *not* students.

5.4.2 Employment Status

More urban Millennial survey respondents reported being employed as compared with rural Millennial survey respondents (71% to 66%). However, the same percentage of urban and rural Millennial survey respondents reported being unemployed. This could mean that there are more job opportunities in urban areas, as it is expected that the difference would be accounted for in the stay-at-home parent, retired and other categories. In fact, it was found that 12% of urban Millennials as compared with 16% of rural Millennials reported being stay-at-home parents, which just about accounts for the 5% difference in reported employment. It is important to keep in mind that a larger percentage of the survey respondents were female as compared with male, and while sharing of household responsibilities has increased over time, women still tend to take on a large portion of the household and child care duties.

The data showed that, as expected, the older generations indicated a greater level of retirement, mostly represented within the Baby Boomer and Depression & War Baby generations. In addition, a large percentage of Millennials and Generation X respondents indicated that they are stay-at-home-parents with only a small percentage of survey respondents indicating as such in the two older generations. Finally, while survey respondents within Generation X and less so within the Baby Boomer generation reported being unemployed, the highest percentage of survey respondents across all area types that indicated that they are unemployed was found within the Millennial generation, ranging from 11% to approximately 17%.

From a survey construction stand point, additional information was not collected from some survey respondents who were employed because they chose "Other" and indicated that they were employed "Part-Time," even though this was addressed if this same survey respondent had chosen "Employed." Therefore, it seems that providing "Full Time Employed" and "Part-Time Employed" is preferable. Much discussion had gone into this nuance during the development of the survey.

Other surveys reviewed in the development phase of the survey instrument did not include a category for "Disabled" ((6), (29), (59), & (60)). However, almost 1.6% of survey respondents self-identified as "Disabled." There are potentially some survey respondents who choose other categories that were presented to them for this question that could have identified as "Disabled" in addition to the category that they chose. Thus, for future surveys, it is recommended that such a category be included to better inform their transportation needs. More details regarding an analysis of these results can be found in *Transportation Preferences, Lifestyle Characteristics of Self-Identified Disabled Survey Respondents* (61).

5.4.3 Number of Jobs

The data indicated that when comparing the percentage of all employed Millennial survey respondents in urban areas to rural areas, a larger proportion of employed rural Millennials reported working more than one job (Figure 31). This could potentially indicate that the pay

associated with a single job in a rural environment is lower, thereby requiring a Millennial living in this area to work more than one job to live the quality of life desired.
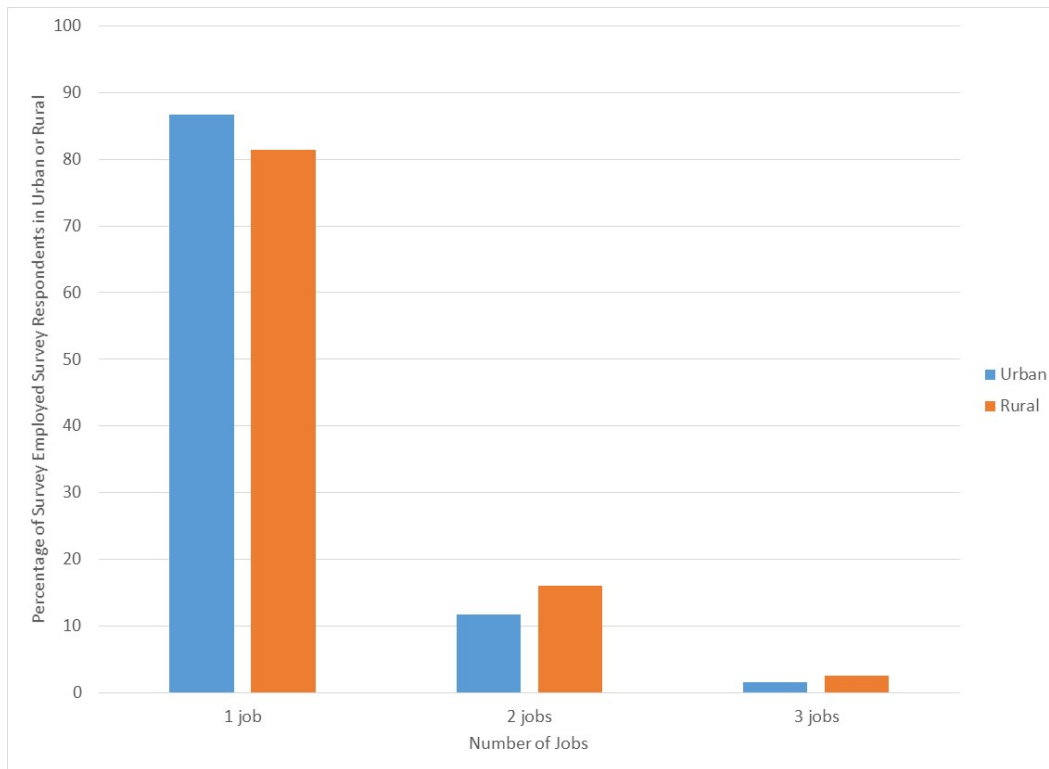
Figure 31: Share of Employed Millennials Working 1, 2, or 3 Jobs in Urban and Rural Areas

When looking at the data across all area types, of those Millennials reporting working one, two, and three jobs, there appear to be an unusually high number of Millennials in "Small Cities" that reported working three jobs.

For each job, survey respondents were asked how many days in a week they traveled to work. One option that was provided was "0; I telecommute from home everyday." Therefore, these results do not take into account those who may telecommute from home for some portion of the days that they work each week. Just under three percent of all survey respondents who indicated that they were employed (46 of 1,541) indicated that they telecommuted to their primary place of employment.

5.4.4 Social Media

The results show that Facebook is the social media platform used "Frequently" by the largest percentage of survey respondents. Snapchat, Instagram, Twitter, Tumblr, LinkedIn, Flickr and MySpace were the second, third, fourth, fifth, sixth, seventh, and eighth most popular social media sources, respectively.

As a whole, for all social media, Millennials had the highest percentage of survey respondents indicating that they "Frequently" used social media. In contrast, Baby Boomers, for all types of social media, had the lowest percentage of survey respondents reporting use of any type.

Typically, Generation X was somewhere in between. This coincides well with findings by the Pew Research Center (62).

One trend was noticed across several of the social media types. For Twitter, Tumblr, Instagram, and Snapchat, there was greater use by urban than rural survey respondents, and there was decreasing use from the Millennial generation to Generation X to the Baby Boomer generation. The percentage of respondents indicating use for Facebook did not follow this behavior, as Generation X had a higher percentage of rural survey respondents indicating that they used Facebook as compared with their urban counterparts. The researchers suggest that this pattern is observed because these individuals may have obtained their bachelor's degree and then moved to the suburbs to start a family. Little can be said about LinkedIn, MySpace, or Flickr, as few survey respondents reported frequently using these social media types.

5.4.5 Level of Agreement

When asked about their level of agreement related to the importance of staying connected to one's phone and/or the internet, Millennials and Generation X indicated a significantly stronger level of agreement as compared with Baby Boomers. This coincides with what Schwieterman (8) discusses, in that Millennials put a high value on remaining connected. In addition, when looking just at Millennials, this seemed to be particularly true of urban Millennials, who reported more strongly agreeing with the statement when compared with their rural counterparts. Therefore, there is a difference between urban and rural Millennials from this standpoint. This result could potentially reflect the challenges with cell phone reception in more rural areas.

Baby Boomers and rural Millennials reported a greater level of disagreement when they were asked whether or not they felt that they had a variety of transportation options that would allow them to get to where they needed to go. It was a bit surprising that when comparing generations, Baby Boomers were found to disagree more; it was expected that Millennials would disagree more. This may indicate that the locations where Baby Boomers currently live do not provide as many transportation options as they desire and that urban Millennials are already located where they feel they have a variety of transportation options. Or, it could indicate that Baby Boomers either do not know about their other transportation options or feel that their level of service makes them undesirable.

Millennials reported a slightly higher sensitivity to the cost of transportation as compared with Generation X and the Baby Boomers, particularly those in urban areas. This result is consistent with findings by Sakaria and Stehfest (6) who reported that cost is one of the most important values for urban Millennial mode choice. This could potentially be tied to the fact that, on average, 46% of urban Millennials reported having student loans as compared with 35% of rural Millennials. With less discretionary income, Millennials may view owning and operating a vehicle, which can be pricy in more urban areas, as a luxury, not a necessity.

Survey respondents were asked regarding their level of agreement of the influence of distance when traveling to 1) work, 2) shopping, and 3) recreation. Overall, while the differences were not extreme, the most pronounced differences in responses were associated with the work trip. Work trips tend to be necessities. So, as transportation planners and engineers, trying to address needs associated with this trip will likely bring the most benefits. The results show that Millennials reported a greater influence regarding the distance to work on how they travel as compared with Generation X and the Baby Boomer generations. Furthermore, urban Millennials reported

agreeing more strongly than their rural counterparts that distance to work influenced their mode choice. This result likely, in part, reflects the more limited transportation choices typically available to rural residents.

Survey respondents were asked about their level of agreement with the walkability of their environment. Overall, few survey respondents reported a strong agreement that their environment is walkable, although Millennials had the highest percentage. Baby Boomers most significantly reported that their environment was not walkable. As a whole, considering questions that asked about modes of choice including this one, it seems that there is an interest by Baby Boomers for more opportunities to walk. However, when asked about adding sidewalks to create such environments (Question 44), they seemed less interested. Therefore, there may be a need for research to better understand how their environment could be made more walkable. In addition, when looking only at Millennial respondents, those in rural environments showed a high level of disagreement regarding the walkability of their environment (Question 37). However, when asked about their interest in having more walkable infrastructure (Question 44), the responses indicated that they did not see the value. Therefore, it could be implied that rural Millennials believe their environments are not very walkable, but they do not see value in changing that.

5.4.6 Number of Vehicles

Overall, across all generations, the majority of survey respondents reported having two vehicles, with one vehicle and then three vehicles being the next two frequently reported counts.

As expected, for all generations the greatest percentage of survey respondents reporting households without vehicles are in the largest urban areas. In addition, the area types that might more generally be considered suburbs, thereby implying lower density, have the least representation of zero-vehicle households. More interestingly, Millennials reported across all area types (e.g., big, dense, city; big-city suburb; lower-density city; suburb of lower-density city; small city; small town; outlying rural area) households that have zero vehicles. This either is a reflection of choice or income level. Finally, whereas the limited data on Depression & War Babies often does not show interesting results, for this question, there was a very large percentage of survey respondents in "Big-City Suburbs" that reported a zero-vehicle household. One might expect that these individuals would have a dependence on others for transportation, which highlights the need for addressing such transportation challenges.

5.4.7 Vehicle Ownership Status

Millennials, when compared with other generational cohorts, had the lowest percentage of survey respondents who indicated that they owned a vehicle. However, they also reported the highest percentage of survey respondents who 1) have regular access to a vehicle that someone else owns or 2) have plans to buy a vehicle in the near future. This would seem to contradict the literature that indicates that Millennials "prefer" public transportation.

While relatively consistent, there is some indication that rural Millennials are more dependent upon a vehicle than urban Millennials (Figure 32).
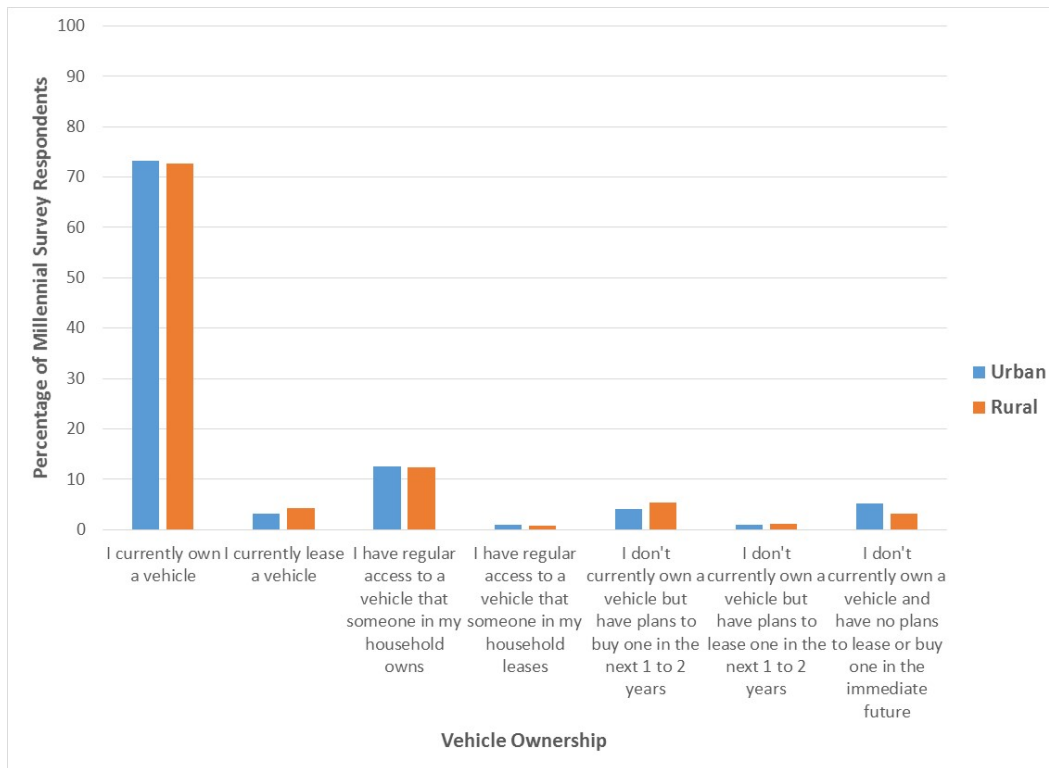
Figure 32: Urban vs. Rural Millennial Vehicle Ownership

This finding is particularly evident in the categories of "I currently lease a vehicle," "I don't currently own a vehicle but have plans to buy one in the next 1 to 2 years," and "I don't currently own a vehicle and have no plans to lease or buy one in the immediate future." The first two categories possibly represent respondents who currently lack the finances to afford a vehicle, but who have an interest in owning one. Rural Millennials showed a preference for these categories as compared with their urban counterparts. The third category provides an indication of wanting to use modes other than a vehicle for transportation, and for this category, there is greater interest from urban Millennials than rural Millennials, which likely reflects the greater number of transportation options available to Millennials. Therefore, again, there is a hint that urban Millennials have a different mobility mindset and financial resources as compared with rural Millennials.

5.4.8 Describe Values

Survey respondents were asked to indicate how well a statement described them. When asked if they liked doing things that are new and different and when asked about how sociable they were, there did not seem to be significant differences between generations or when comparing urban and rural Millennials.

When asked about buying for quality, as compared with price, there was definitely a difference between Millennials and the Baby Boomer generation – Millennials reported placing a larger value on quality over price. When looking at just the Millennial survey respondents, those in urban areas placed a slightly greater value on quality over price when compared with rural Millennials.

When asked whether they valued products with the latest technology, Millennials reported the greatest interest in the latest technology as compared with Generation X and the Baby Boomers. This was particularly pronounced in the "Does not describe me category," as the Baby Boomers had the greatest percentage choosing this category. More interestingly, when looking at urban vs. rural Millennial survey respondents, rural Millennials reported both a strong level of agreement and disagreement, with more urban Millennials choosing the indecisive "Somewhat Describes Me."

When asked about their valuation of their independence above all else, the Baby Boomer generation had the highest percentage of respondents reporting that it described them very well. This is somewhat surprising considering that there is a perception that Millennials are fiercely independent (see Twenge (4)). However, it could potentially hint at Baby Boomers getting older and realizing that their ability to be independent as they age may be challenged. The Baby Boomers also slightly edged out the other generations in their disagreement with this statement as well, showing again that Baby Boomers, as compared with the younger generations, seem to definitively choose positive or negative, as compared with the in-between category. This seems to hint at the state of life that the Baby Boomers are in; they might be less open to change or to considering an alternative view. When looking at the urban vs. rural Baby Boomer responses, the urban Baby Boomers were found to agree whereas the rural Baby Boomers were found to disagree with their valuation of independence. Even more interestingly, rural Millennials seem to exhibit somewhat similar behavior to that of Baby Boomers, as they had a larger percentage of respondents agreeing or disagreeing with their valuation of independence, whereas urban Millennials often chose the indecisive, "Somewhat Describes Me" category.

Overall, generations reported consistently in their agreement with their valuation of local/authentic experiences, except that fewer Baby Boomers choose the in-between category and instead indicated that they felt that valuing local/authentic experiences did not describe them well. Because of this difference, the Baby Boomer generation was looked at more specifically; while the urban Baby Boomers were either indecisive or disagreed, the rural Baby Boomers reported a valuation of local/authentic by almost 10% more than their urban counterparts.

Millennials reported valuing the environment more when compared with the other generations. Interestingly, this was the only category in which Millennials had the lowest percentage of respondents choosing the in-between category. This implies that Millennials are more decisive in their opinion regarding their value of the environment as compared with the other statements they were asked about. This result could be somewhat reflective of the "life-cycle effect" (see Pew Research Center report (29)). While the differences are minimal, it appears that the urban Millennials agree slightly more whereas rural Millennials reported a slightly greater disagreement.

5.4.9 Household Internet

An average of 94% of Millennials reported having household internet. The only variation was reported by Wisconsin Millennials in "Big, Dense Cities," where less than 80% reported having household internet access. One possible explanation for this discrepancy is that a large number of Wisconsin respondents may be students living in urban areas who are using internet provided through their educational institution.

Looking at all respondents, approximately 90% of survey respondents reported having household internet. In addition, although there was limited data from the Depression & War Baby generation,

there were about 20% fewer Depression & War Baby survey respondents in small towns who reported having household internet.

5.4.10 Moving

Approximately 20% of both urban and rural Millennials indicated that they anticipated moving within each of the first three categories of response options (within 1 year, 1 to 2 years, or 2 to 3 years). (Note: Move was not defined, therefore, moving could constitute moving from one residence to another in the same zip code, or it could mean moving to a rural area or even out-of-state.) There was an exception of urban Millennials planning to move within 1 year, which was slightly greater than the others). This percentage jumped to just under 30% when asked about a longer time frame, 4 years or more. This time frame was presented as a response option in order to compare it to a 3 to 4 year time frame, because many students often take 4 years to complete their education.

Generation X showed similar results. For the first three moving categories, about 16% of respondents in urban areas and 9% in rural areas on average indicated that they anticipated moving. For the long-term category, a 4% increase was seen as compared with only a 1% increase for urban vs. rural Generation X survey respondents. Only about 4% of Baby Boomer survey respondents indicated that they anticipated moving in the near future categories (within 1 year, 1 to 2 years, 2 to 3 years) as compared to 7% in the long-term category (4 or more years). Depression & War Baby survey responses seemed to vary, likely representative of a smaller sample size.

As a whole, a greater percentage of urban survey respondents reported an expectation of moving than their rural counterparts. Because of the ambiguity of the question (which was selected to keep the question consistent across all survey respondents), these results could be representative of the high percentage of Millennials that are renting, which could require them to move frequently. We would expect to see this more in urban areas.

5.4.11 Number in Household, Children in Household, Living Situation

Survey respondents reported anywhere from one to twenty people living in their household, with the largest number reporting that they live in two-person households. However, when looking at just Millennials, two, three and four person households were approximately equally common.

On average, across all area types, about 50% of Millennial households reported no children in their household. Therefore, since the household size categories are about equal for two, three and four-person households, it does not seem that all of the three and four person households reported by Millennials consist of children. This would imply that they are either living with their parents or roommates. In fact, when asked about their living situation, approximately 35% of Millennial survey respondents reported 1) living with parents or family or 2) living with roommates. When looking at urban vs. rural Millennial survey respondents, a slightly greater percentage of urban survey respondents reported living with roommates. A result that was a bit surprising was that almost 40% of Millennials survey respondents indicated that they were married. Popular media would seem to imply that few Millennials are married, and this does not seem to be the case. However, when compared with Generation X and Baby Boomers, this is comparably small as just under 65% of those generations reported being married. This comparison also shows that the largest difference between generations was reported for the living with parents/family category, with Millennials reporting this category almost two and a half times more than the other

generations. Another notable find, consistent with concerns identified in the literature, is that Depression & War Babies had the largest percentage of survey respondents reporting that they lived alone. Considering that this generation may have physical limitations reducing their ability to drive, providing opportunities for this generation to travel to desired destinations and interact with others is important to their well-being, thereby highlighting the importance of considering what transportation options are available for this generation.

5.5   Comparing Preferred Modes to Modes Used in a Typical Week

Questions 35 and 36 were crafted to gain an understanding of how one's preferred mode relates to how a survey respondent would prefer to travel. According to the literature review findings, the Millennial generation prefers to make use of a variety of modes of transportation. Considering that transportation systems throughout the United States still tend to be designed for the automobile, the researchers anticipated that Millennials might be more likely to report a preferred mode that is different than what they have identified using in a typical week. To try to gain an understanding as to whether or not survey respondents are satisfied with the modes currently available to them, the researchers compared the modes a survey respondent indicated they used in an average week (Question 35) with the mode that they indicated they would prefer to take to 1) work, 2) school, and 3) recreational activities. If the mode that they preferred for one of the trip purposes was not identified as one they had actually used within an average week, the researchers concluded that there is a possibility that the survey respondent may be interested in taking a mode that is not currently available to them. Findings were that some respondents did in fact choose a preferred mode that was not reported as a mode they took in a typical week. Figure 33 shows the percentage of Millennial, Generation X, and Baby Boomer respondents that preferred a mode of travel that was not used in their typical weekly travel.
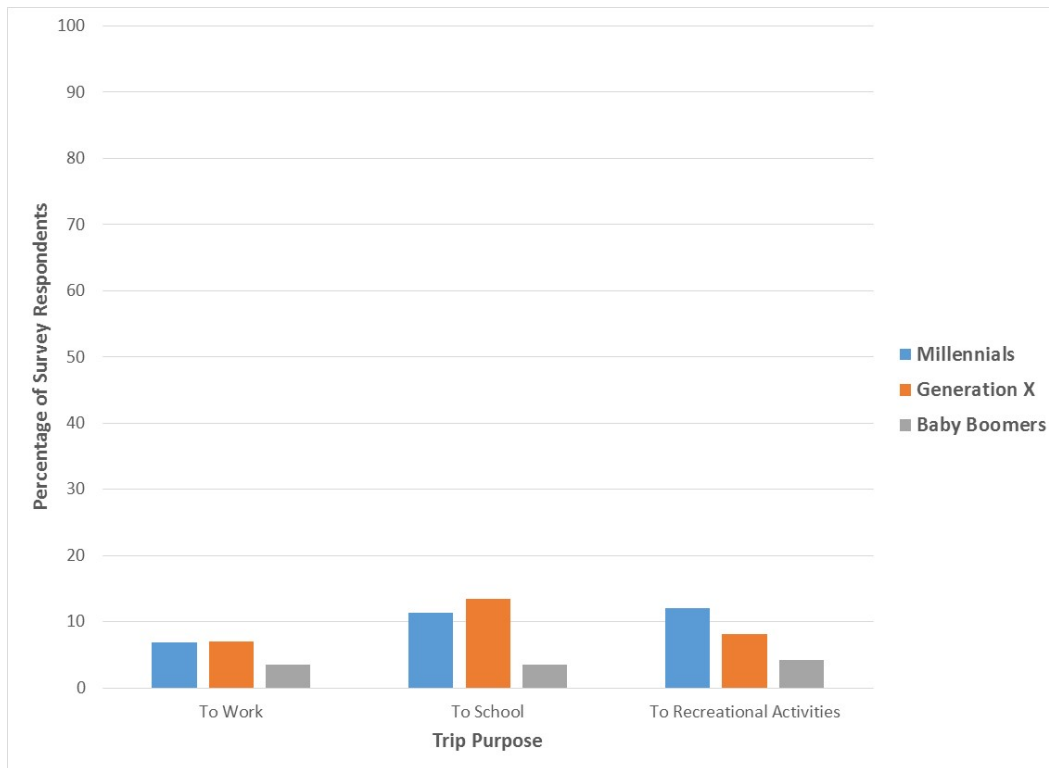
Figure 33: Percent of Respondents, Preferring a Currently Unreported Mode by Generation and Trip Purpose

For all trip purposes, a significantly greater percentage of Baby Boomers' preferred mode was found to be represented in a mode they reported using in an average week, as shown by the relatively small bar charts in (Figure 33) (e.g., more than 90% of both urban and rural Baby Boomers reported using the automobile). This would imply that Baby Boomers would be less likely to see the need for additional transportation mode options. In contrast, the percent of Millennials and Generation X survey respondents choosing a mode not represented in their weekly travel was about twice as many Baby Boomers. One important note regarding this analysis, is that this difference could also to some degree reflect the Baby Boomer generation survey respondents not understanding that they could choose a "preferred" mode that may not be available to them.

Looking only at the Millennial generation, it appears that survey respondents from Montana are more satisfied with the modes available to them (Figure 34).
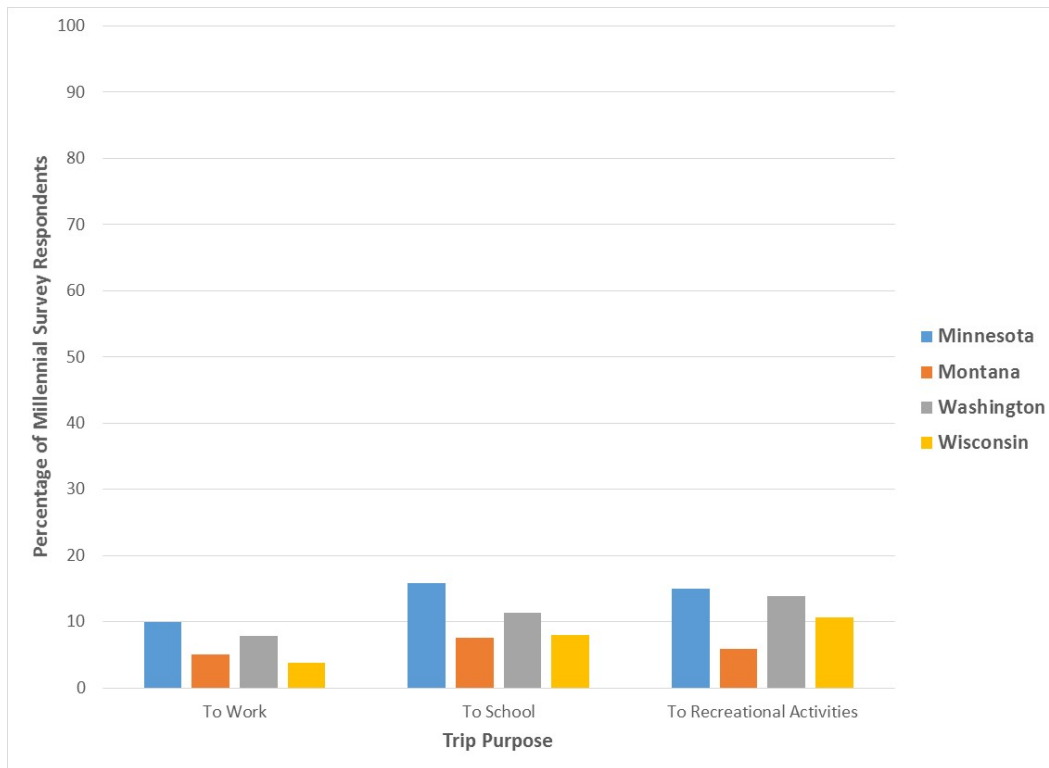
Figure 34: Percentage of Millennial Respondents That Would Prefer to Use a Mode Not Currently Used, by State

This finding is interesting in that Montana is more rural than other states included in the study, so there is an expectation that survey respondents may have fewer modes of travel, particularly public transportation options available to them. For each category, Minnesota and Washington State survey respondents reported a preference for a mode that is not currently used by them in their weekly travel. Figure 33 also shows that there seems to be a greater dissatisfaction with the modes available for traveling to school and recreational activities. Interestingly, the two modes that were identified by Millennial respondents as being preferred are automobile and carpool. This result ties back to the Millennial survey respondents indicating to a greater degree when compared with Generation X or Baby Boomers, that they wanted to purchase a vehicle in the next one to two years (Question 47). Therefore, again, it does not seem that Millennials are as interested in "car-free" lifestyles as has been portrayed in the media.

Similar to the Millennials, Generation X survey respondents in Montana are consistent in reporting that the mode they prefer is also a mode they identified as using in an average week (Figure 35).
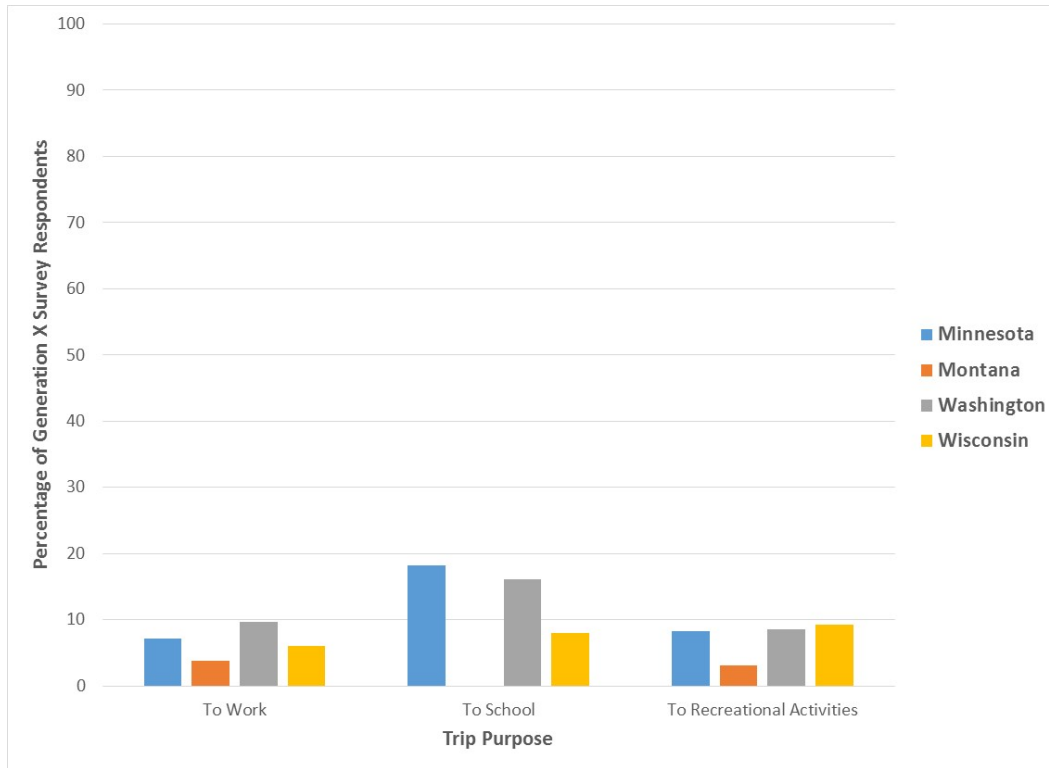
Figure 35: Percentage of Generation X Respondents That Would Prefer to Use a Mode Not Currently Used

Interestingly, Generation X survey respondents in Minnesota and Washington indicated a preference for using the bus when traveling to school. Again, it seems that more Generation X survey respondents seem to have a preference for non-automobile modes than the Millennials.
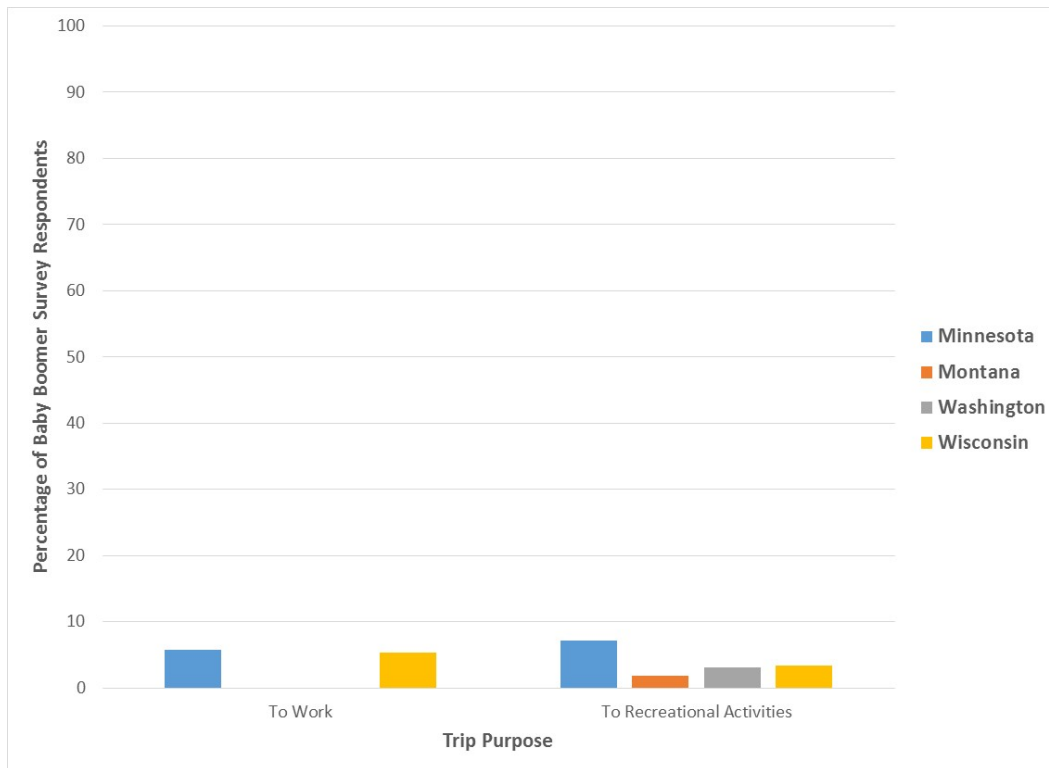
Figure 36: Percentage of Baby Boomer Respondents That Would Prefer to Use a Mode Not Currently Used

Few Baby Boomers reported being students. Therefore, "To School" is not reported. Overall, as shown by multiple bar graphs being at or near zero, Baby Boomers consistently reported that their preferred modes are the same ones they use in a typical week (Figure 36). Again, Baby Boomer survey respondents may not have realized that they could have chosen a mode that is currently not available to them. However, if they did understand this, then, when compared with the younger generations, it would imply that the current transportation system was designed with the Baby Boomer preferences in mind.

5.6   Geographic Preference for Public Transportation, Bicycling, and Walking

Survey respondents were asked whether or not they would like 1) additional public transportation, 2) more bicycle infrastructure and 3) more sidewalks. The question assumed that survey respondents would understand the connection between having more infrastructure and the ability to use these modes. The earlier results looked at the responses by generation and compared urban vs. rural. Here, we look at the spatial response, to see if any further conclusions can be drawn. First, the researchers looked for a pattern based on each individual response (Figure 37).
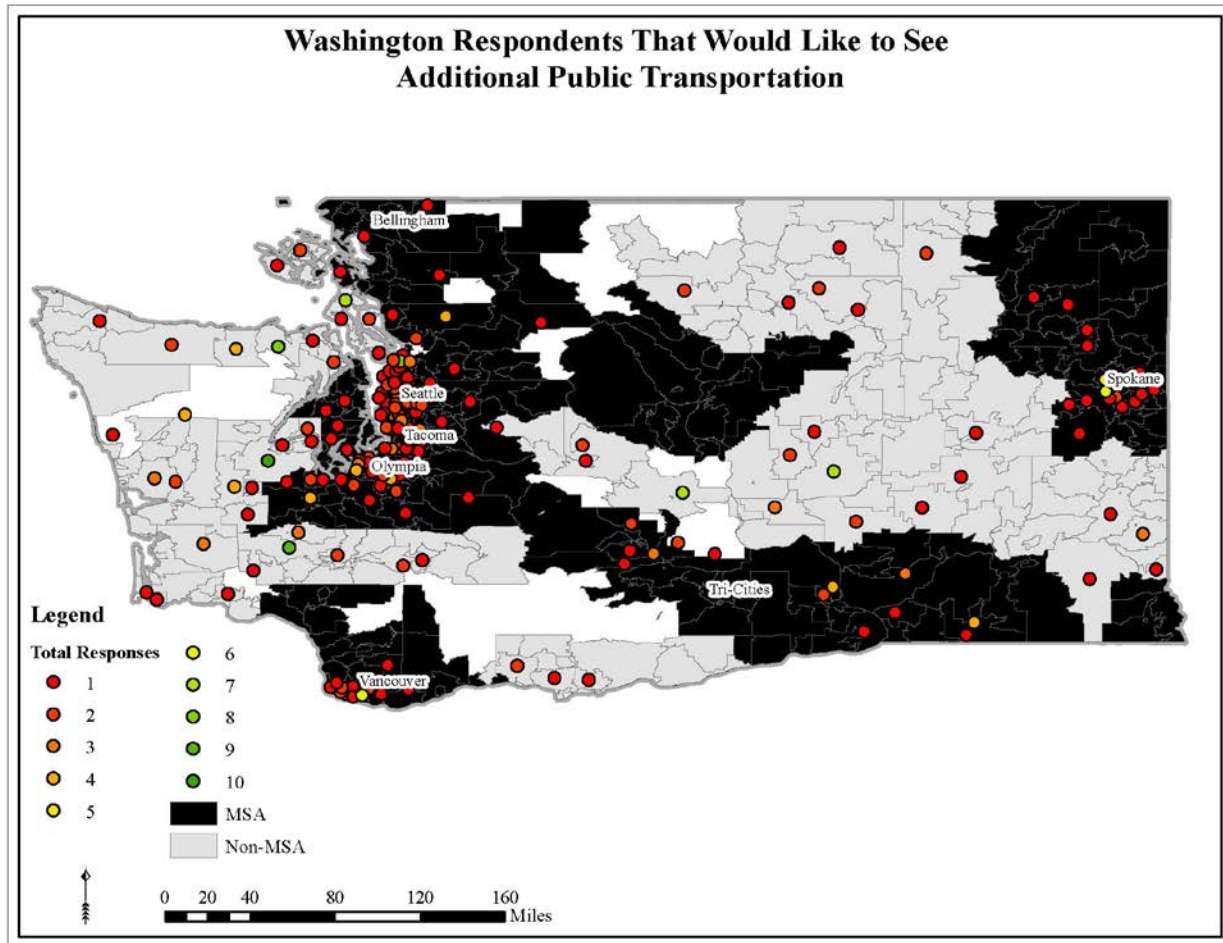
Figure 37: Individual Responses, Preference for Public Transportation, Washington State

No clear pattern was observed regarding a preference for or against additional public transportation. This can happen when looking at data at a microscopic level. Therefore, researchers considered how to better aggregate the information collected.

The researchers grouped responses by zip code. If the majority of the survey respondents indicated a preference for additional provisions, the zip code area was shaded in green. If there was an even split, it was shaded in yellow. If there was a preference towards not wanting additional provisions, it was shaded in red. Figure 38 through Figure 49 show the results for 1) public transportation, 2) bicycling, and 3) walking in Minnesota, Montana, Washington State, and Wisconsin.
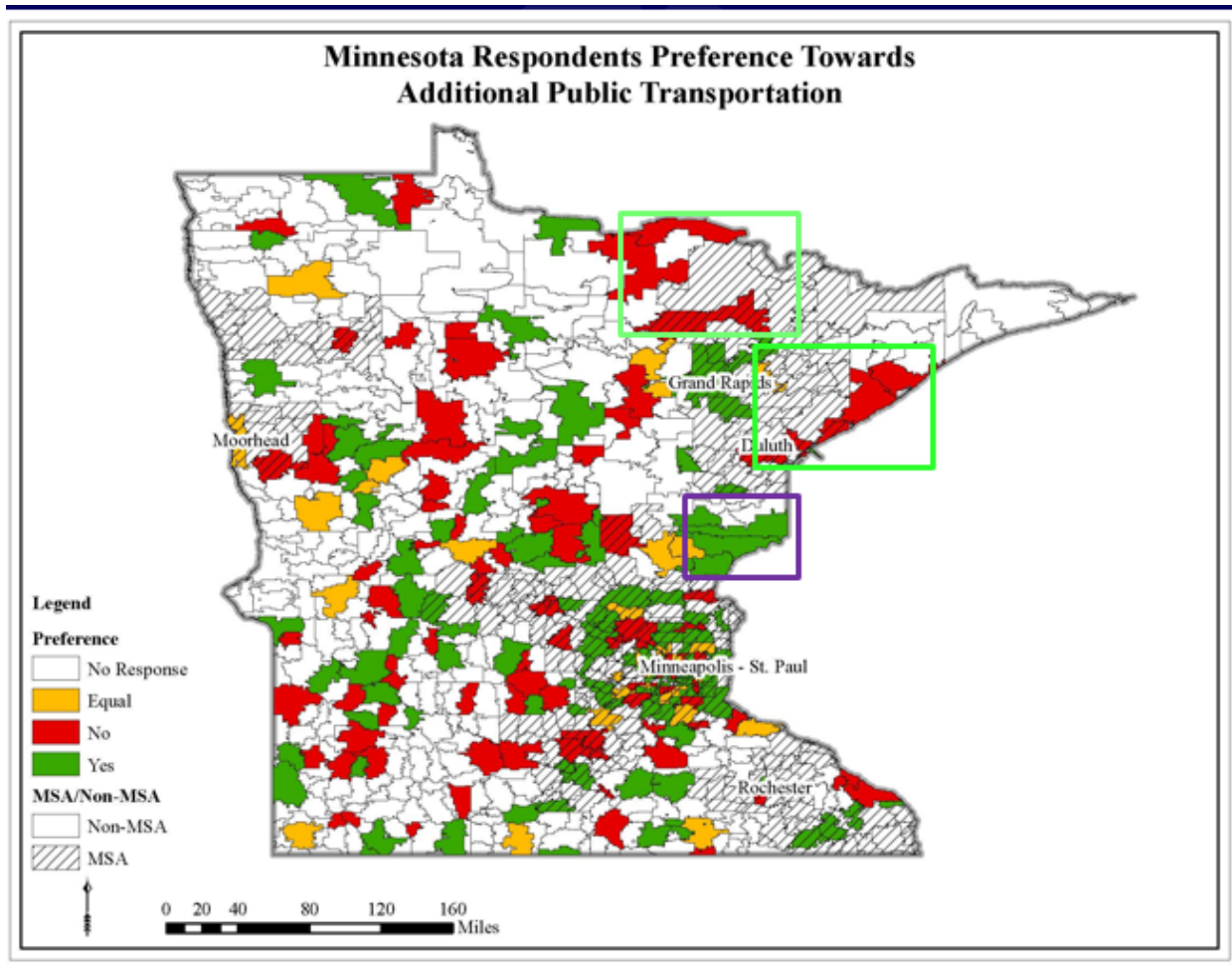
Figure 38: Spatial Preference for Public Transportation in Minnesota

Figure 38 shows that northeastern Minnesota would not have a preference for additional transportation provisions. In contrast, the area just north of the Twin Cities metropolitan area that borders western Wisconsin might be a good candidate area to investigate citizen interest in additional public transportation.
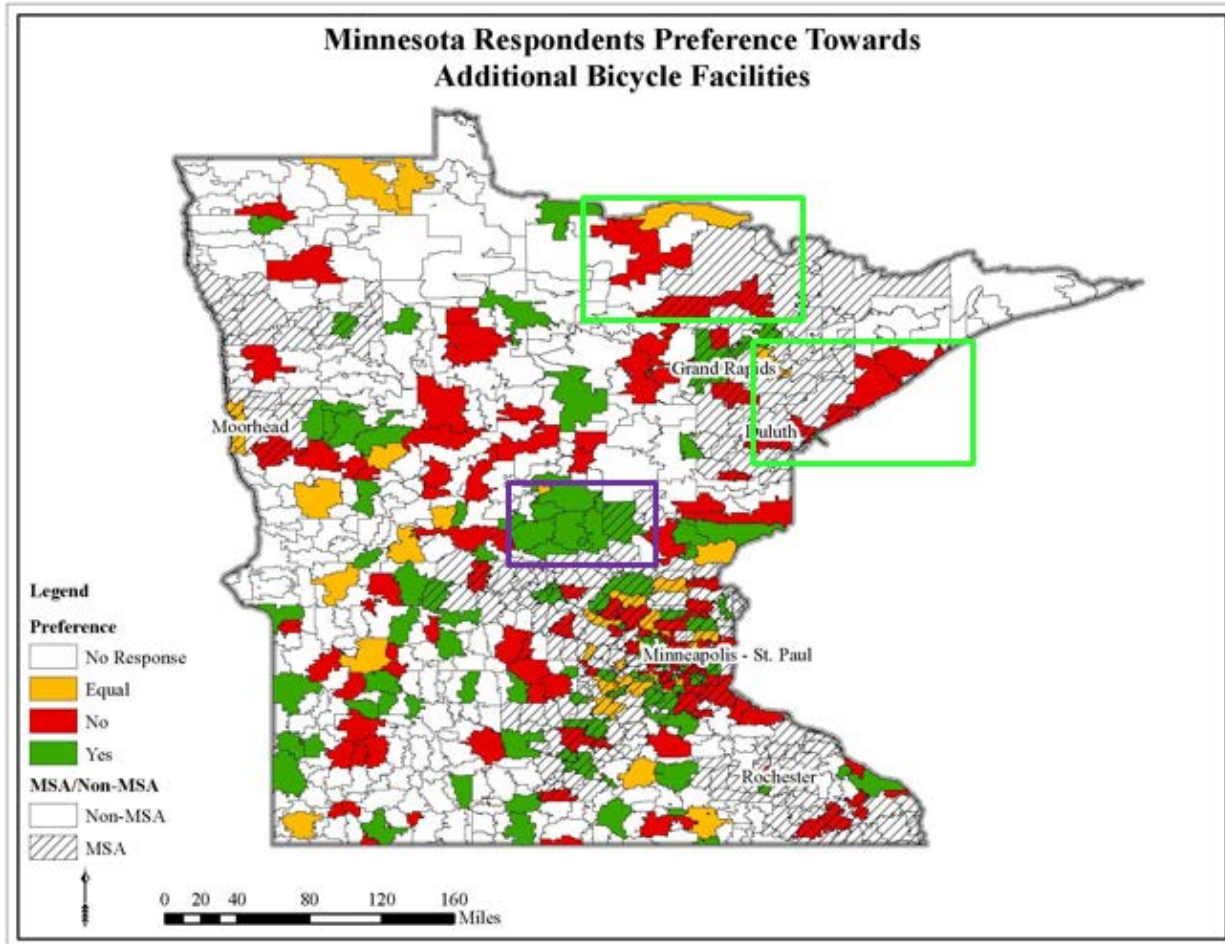
Figure 39: Spatial Preference for Bicycling in Minnesota

Similar to the findings for public transportation, northeastern Minnesota does not have an interest in additional bicycling facilities (Figure 39). This result could reflect the topography, which could make bicycling unappealing. Lake Superior's north shore has steep cliffs with rocky terrain and vast swaths of forest. In contrast, residents in the St. Cloud area (central Minnesota) would be interested in additional bicycling infrastructure. The state should consider this in its planning for bicycle facilities.
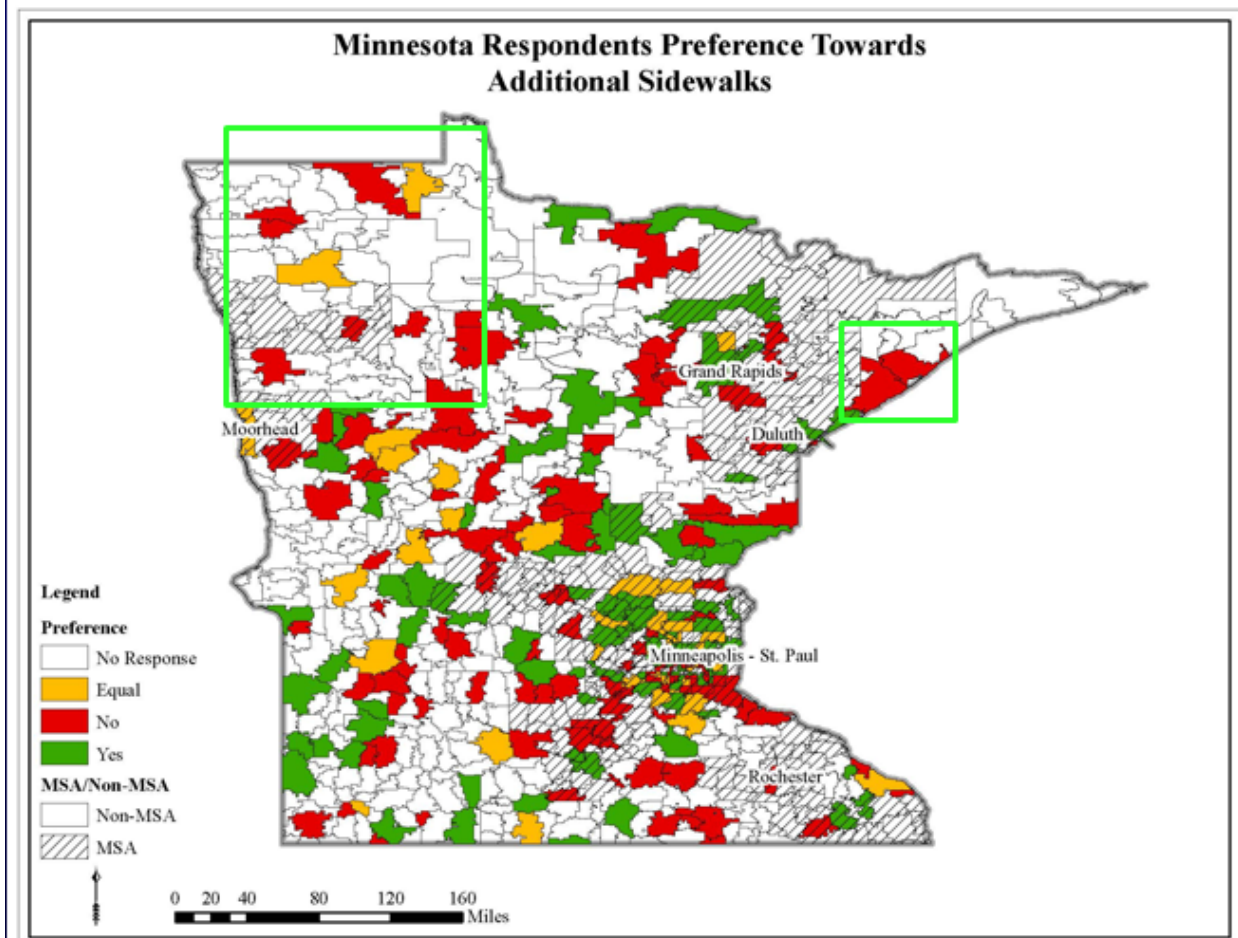
Figure 40: Spatial Preference for Sidewalks in Minnesota

The northwestern part of Minnesota does not seem to be interested in additional sidewalks (Figure 40). This is a relatively rural part of the state, so it is not unexpected. Additionally, as was seen for public transportation and bicycling, the North Shore (or far northeastern Minnesota) does not seem to be interested in sidewalks. However, this result is only true for survey respondents near Duluth, whereas for the public transportation and bicycling results, it was true in both the area near Duluth and the area bordering Canada.

Overall, for the State of Minnesota, there seems to be more clearly defined areas where the majority of survey respondents were not interested in additional active transportation provisions. Readers should be cautious in drawing definitive conclusions based on these analyses. Rather, these results provide recommendations on locations that might warrant further investigation by the DOT.
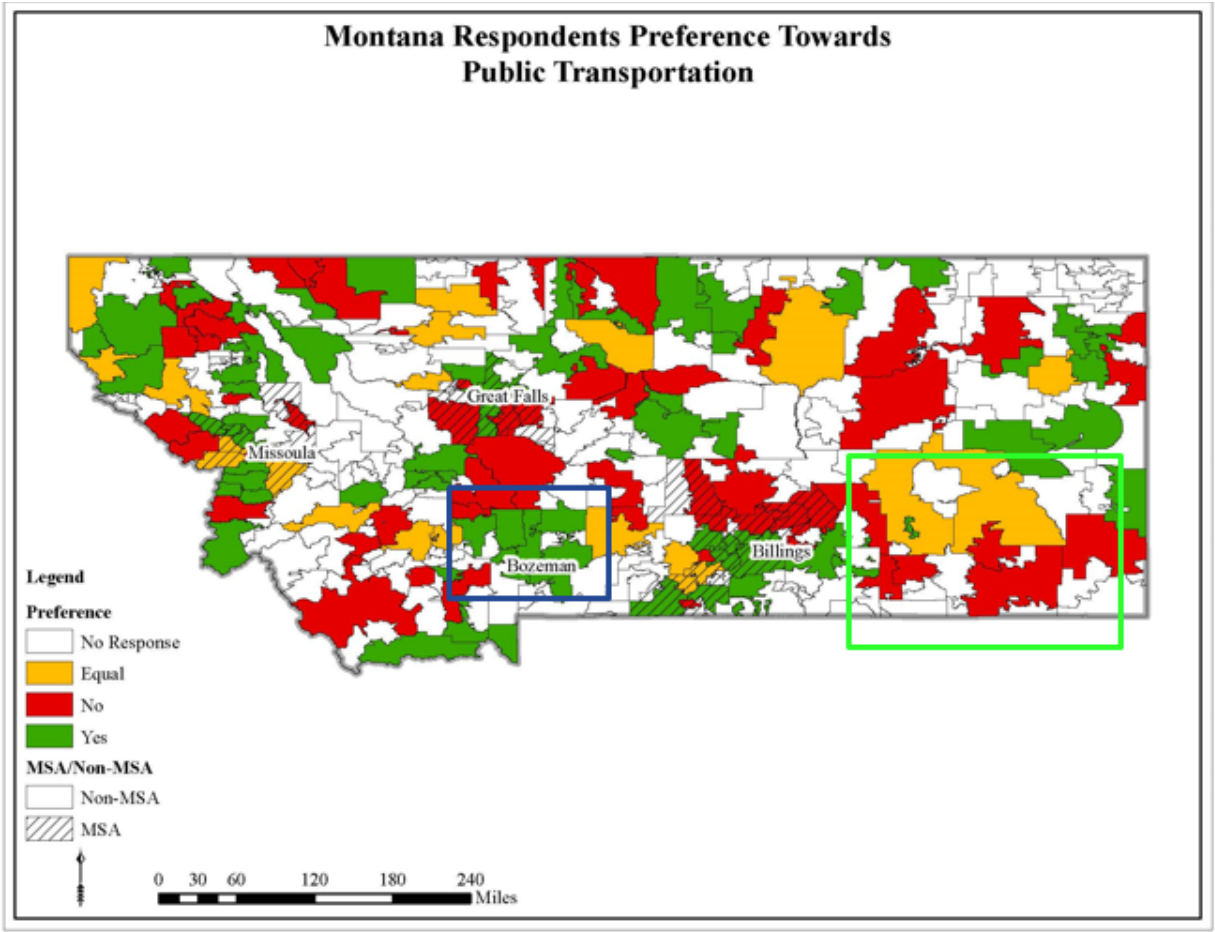
Figure 41: Spatial Preference for Public Transportation in Montana

Figure 41 shows the results regarding survey respondents' reported interest in additional public transportation in Montana. It appears that the southeastern part of the state is not interested in public transportation. In contrast, the Bozeman area seems to have an interest in additional public transportation service.
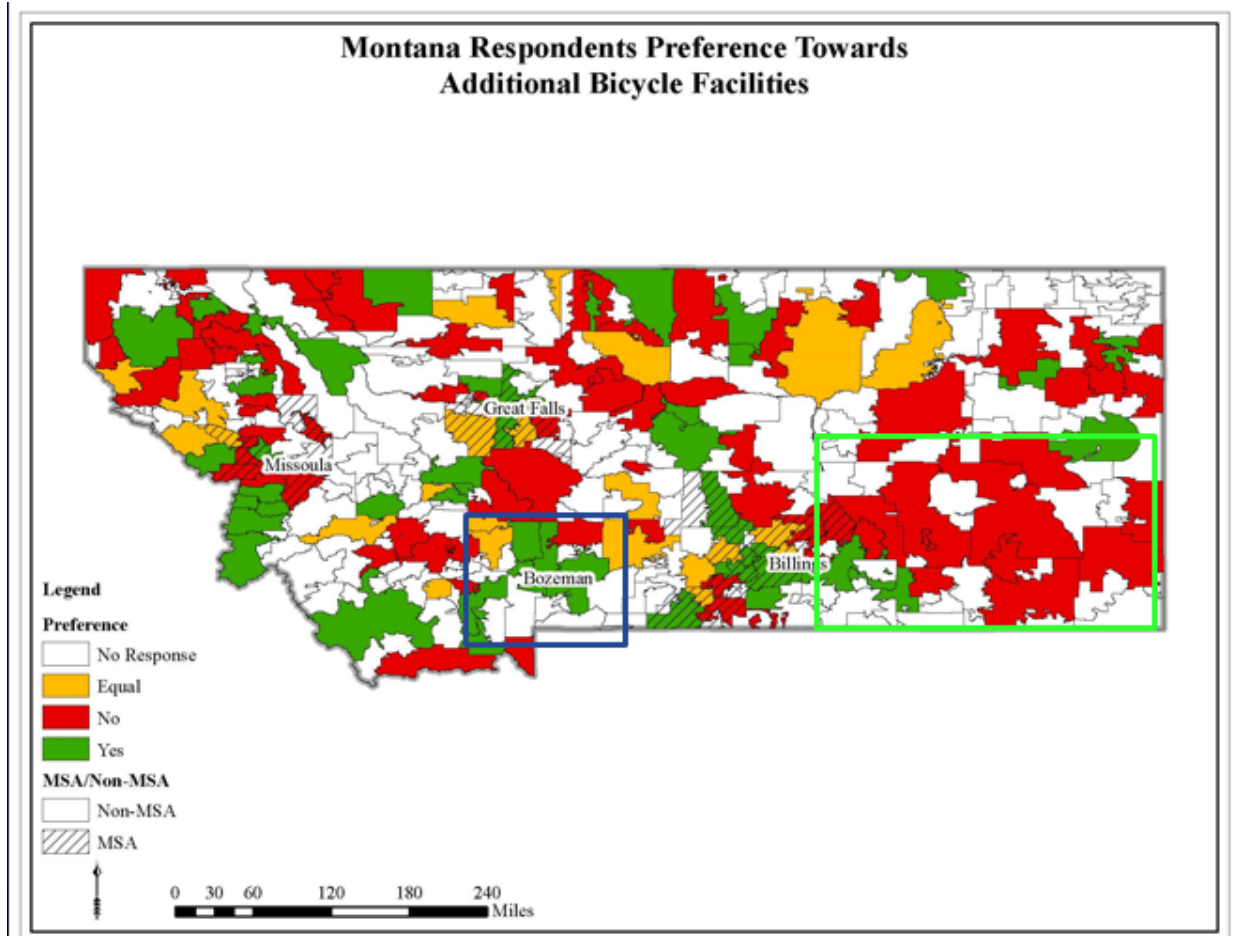
Figure 42: Spatial Preference for Bicycling in Montana

The results for bicycling are similar to the results for additional public transportation (Figure 42). Interestingly, with regard to public transportation, the southeastern part of the state was somewhat divided in that survey respondents from some zip codes were found to be equal in their preference for or against public transportation. However, when it comes to bicycling provisions, that part of Montana clearly indicated "No." Another interesting result is related to Missoula. Most survey respondents indicated a preference for not having additional bicycling provisions. This is of particular interest because Adventure Cycling has its headquarters here (63).

**Montana Respondents Preference Towards
Additional Sidewalks**
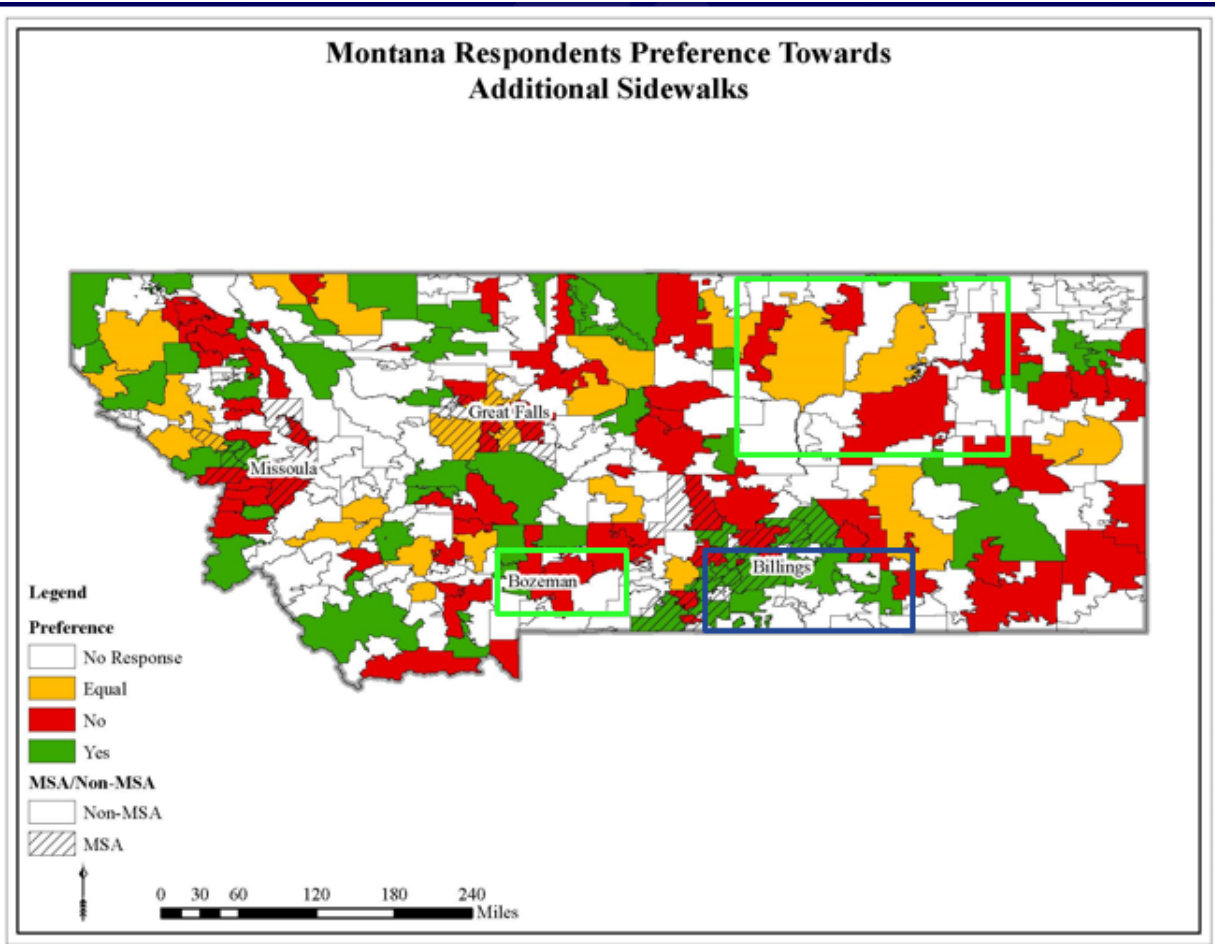
Figure 43: Spatial Preference for Sidewalks in Montana

The results related to additional sidewalks did not align with the other results. The northeastern part of Montana did not have an interest in sidewalks (Figure 43). In addition, whereas Bozeman survey respondents expressed interest in public transportation and bicycling, this was not true for sidewalks. Billings, on the other hand, did show an interest in more sidewalks.
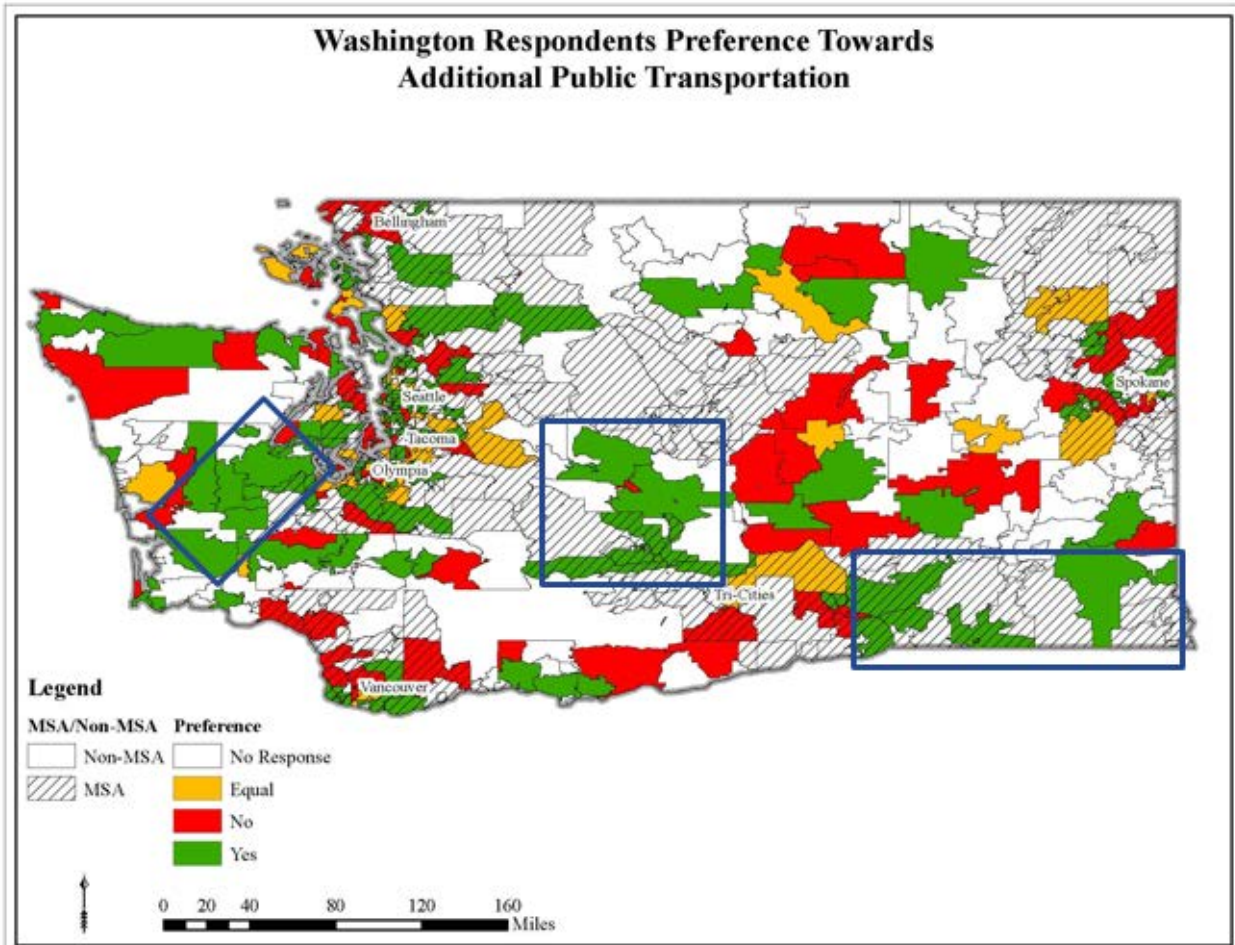
Figure 44: Spatial Preference for Public Transportation in Washington State

The results for Washington State were significantly different than those for Minnesota and Montana. In Washington State, there were three visible groupings with strong interest in additional public transportation. In the previous two states, there were some areas of the state that clearly showed no interest in public transportation, and only one location per state showing interest (Figure 44).
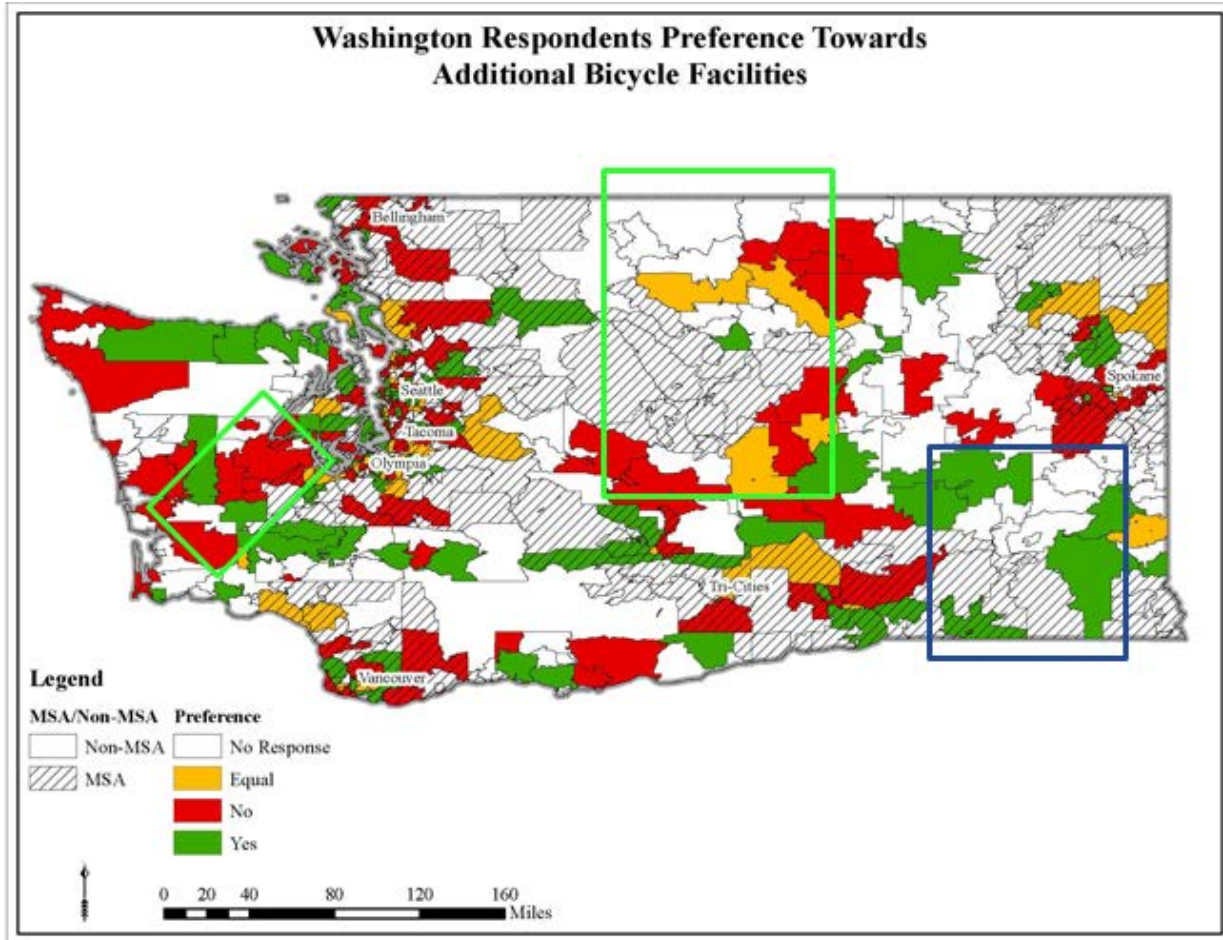
Figure 45: Spatial Preference for Bicycling in Washington State

The results for bicycling were not as obvious (Figure 45). However, there appears to be some interest in the southeast part of Washington State. The central part of the state does not show an interest in additional bicycling provisions. The area radiating southwest from the Seattle core had shown interest in public transportation; however, the same area shows seemingly no interest in bicycling. This was similar to earlier results, in which survey respondents did not show interest in active transportation (e.g. public transportation, bicycling and walking) as a whole. Instead, they showed a preference for only one mode or maybe two.
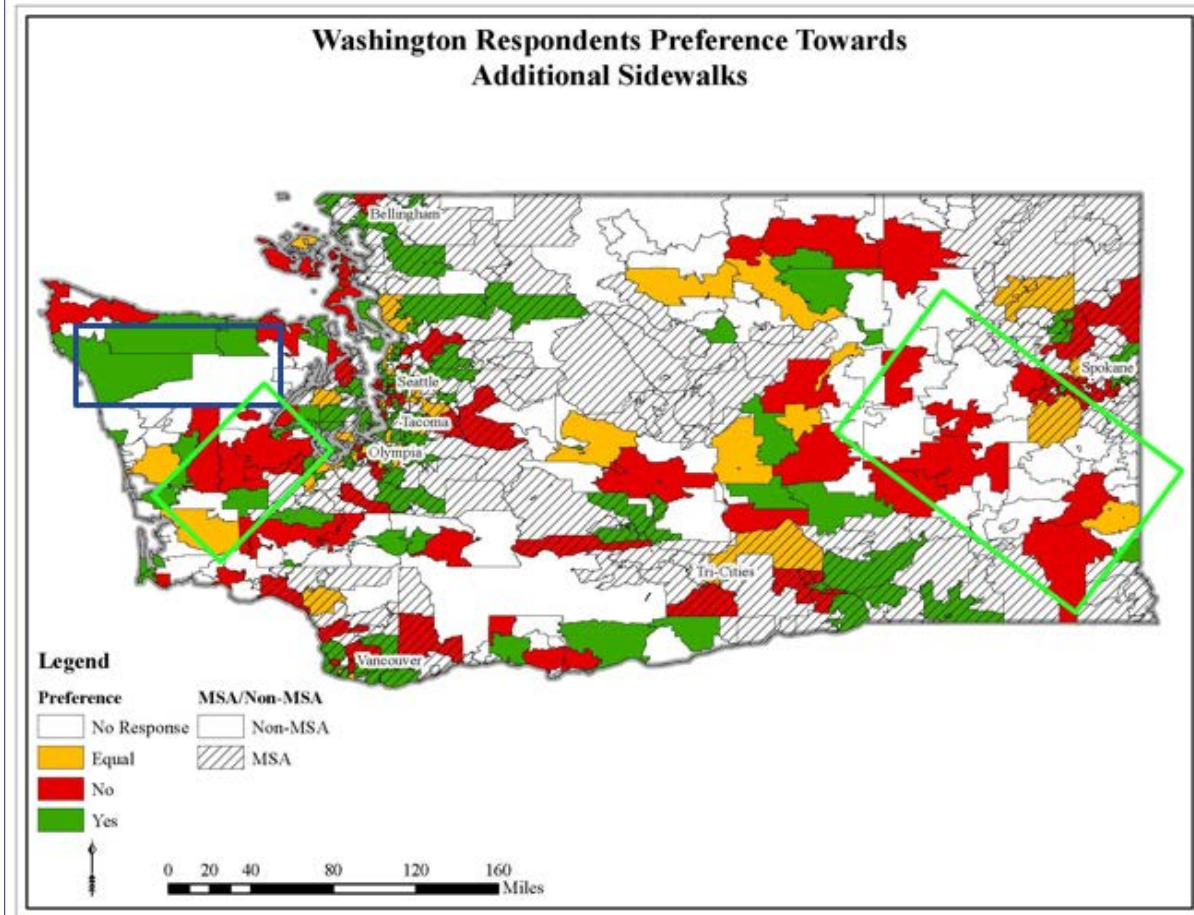
Figure 46: Spatial Preference for Sidewalks in Washington State

Some of the results for sidewalks are similar to those found for bicycling. The southwest area radiating from the Seattle area that was not interested in bicycling was also not interested in sidewalks (Figure 46). However, the zip codes that are near the northwest peninsula of Washington State seem to have an interest in sidewalks. These areas might be expected to draw more tourists; therefore, they could potentially see the value of sidewalks. In contrast, the eastern part of the state, which is more rural, would appear not to have an interest in sidewalks, which could be correlated to the lack of tourists.
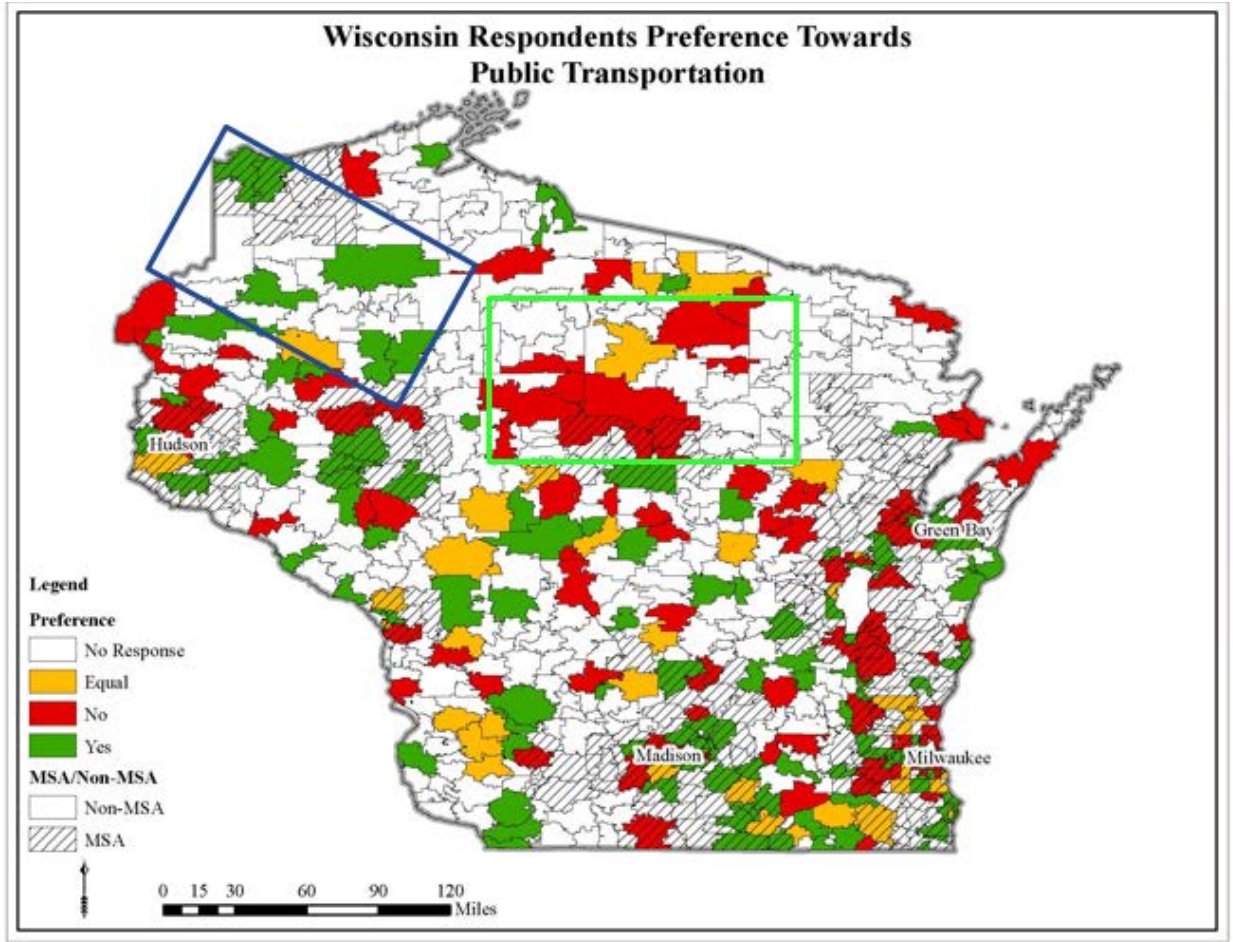
Figure 47: Spatial Preference for Public Transportation in Wisconsin

In Wisconsin, survey respondents from the north central part of the state did not show an interest in public transportation (Figure 47). In contrast, those survey respondents who are located in the northwestern part of the state, between the metropolitan areas of St. Paul/Minneapolis and Duluth in Minnesota, seem to have an interest in public transportation. It could be that survey respondents find value in having connectivity to these economic hubs.
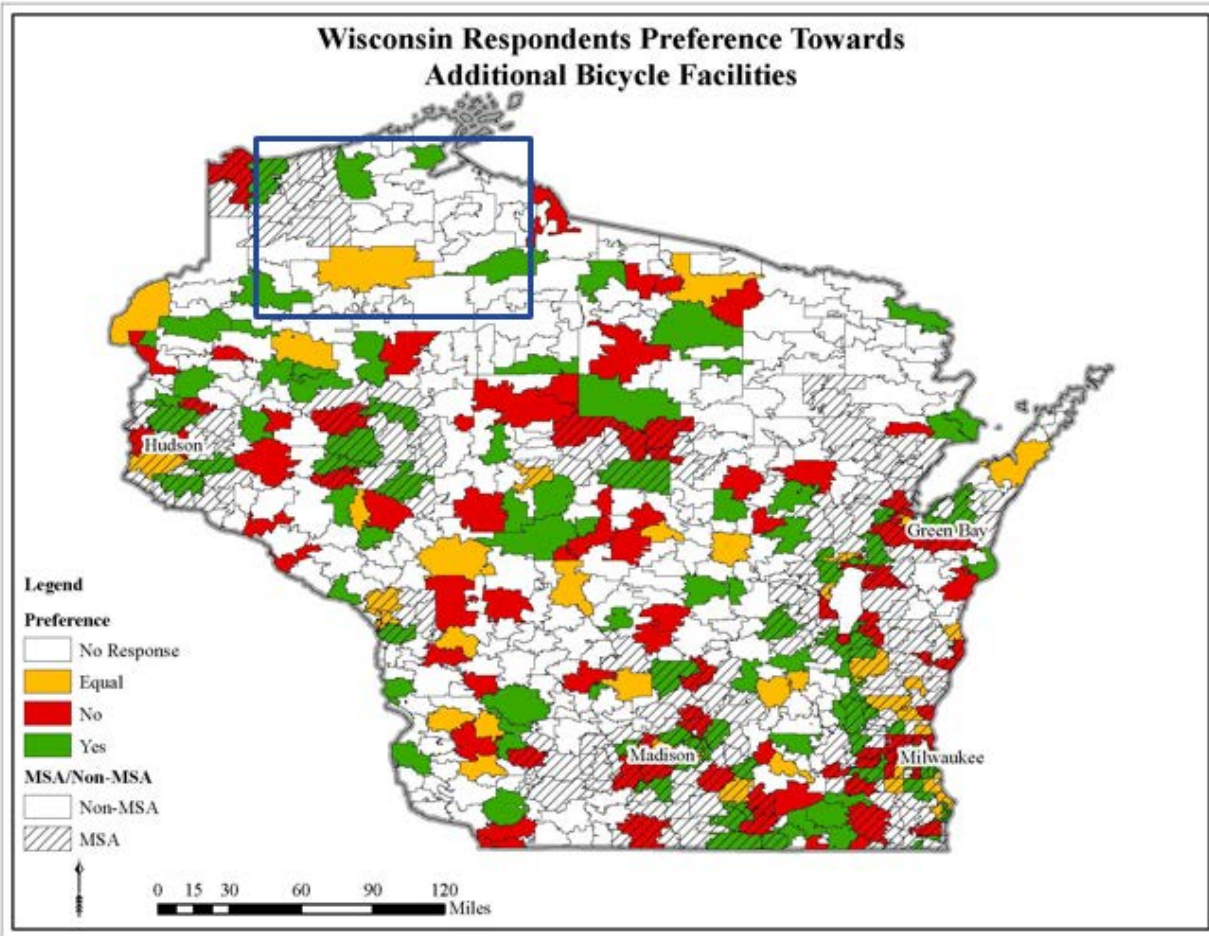
Figure 48: Spatial Preference for Bicycling in Wisconsin

The northern part of Wisconsin shows some interest in bicycling facilities (Figure 48). The northern part of the state tends to attract more tourists; therefore, the interest in additional bicycling facilities may reflect support for facilities that nurture tourism as an economic driver.
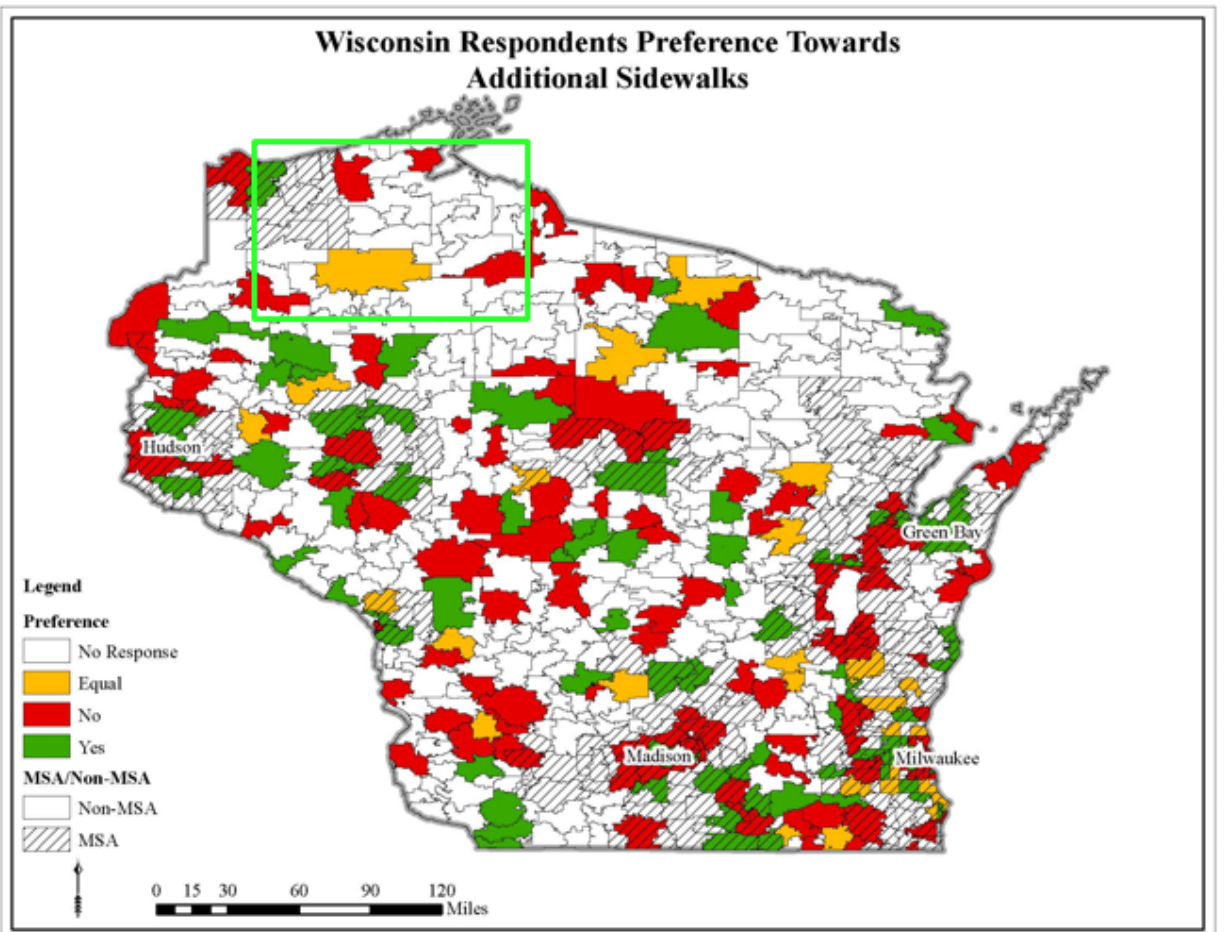
Figure 49: Spatial Preference for Sidewalks in Wisconsin

In contrast to the findings for bicycles, the northern part of the state of Wisconsin does not seem to have an interest in additional sidewalks (Figure 49). However, this could reflect the rural nature of this part of the state.

5.7   Walkability Analysis

Survey respondents were asked to rate the walkability of where they currently live. Walk Score, whose mission is to "promote walkable neighborhoods" (64), provides quantitative ratings based on zip codes. Researchers wanted to understand how survey respondents' rating of the walkability of their environment compared to the Walk Score provided for that zip code. As such, for every zip code, a Walk Score was deduced. The results of the Walk Score for a given location as compared with a survey respondent's categorization of the walkability of the same location is presented in Figure 50.
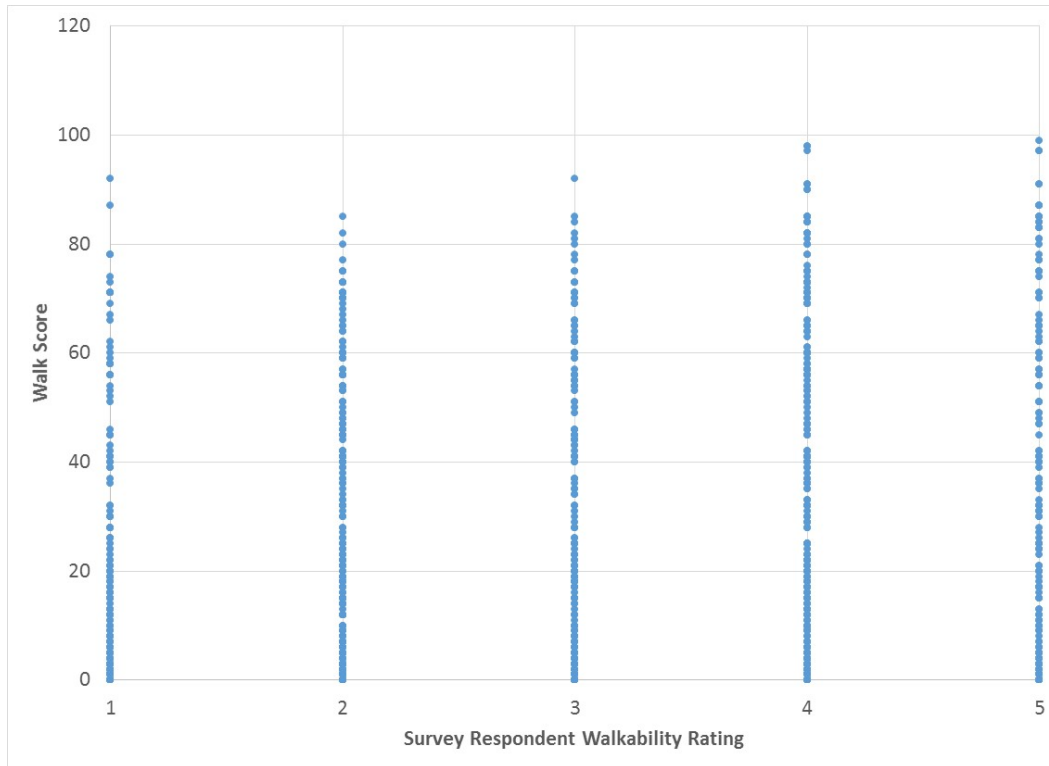
Figure 50: Walk Score vs. Survey Respondent's Walkability Rating

In general, the results show that the Walk Score does not seem to correlate well with a survey respondent's assessment of the walkability of the same environment. If it had, as the rating increased from 1 (poor walkability) to 5 (walkable environment), the data should have been clustered around a point that increased as the walkability rating increased from 1 to 5. For example, if the cluster for the rating of 1 had stopped at about 33, with very few points then after, then this would have represented a low Walk Score, which would have correlated relatively well with a low walkability rating by survey respondents. Then, if the cluster from about 33 to about 50 for number two had dominated, this would show a slight increase in Walk Score associated with survey respondent walkability rating.

The researchers looked in more detail at the rate at which a Walk Score of zero was identified for each category of survey respondent rating of walkability (Figure 51).
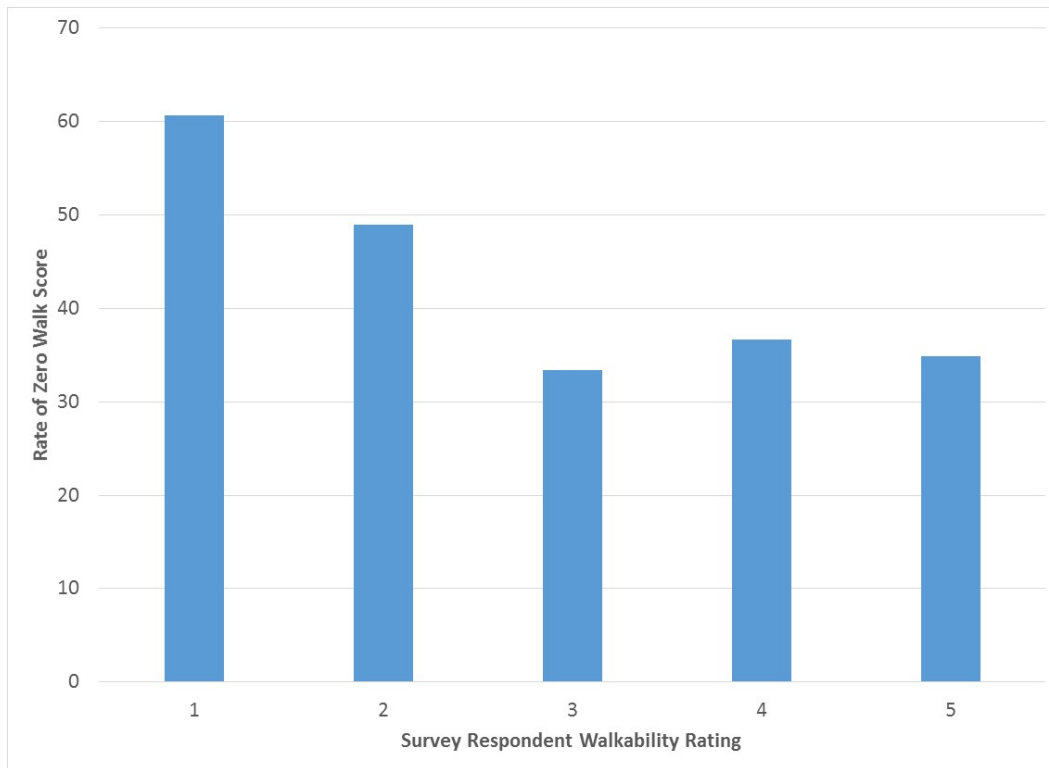
Figure 51: Rate of Observing a Zero Walk Score vs. Survey Respondent's Walkability Rating

The results show that as expected, a low walkability rating by a survey respondent had a much higher representation of a zero walk score rating. However, rather than continuing to decrease as the survey respondent's walkability rating increases, the rates of zero walk score are almost equal, particularly for the 3, 4 and 5 walkability ratings. Therefore, either there are limitations associated with the Walk Score, or survey respondents do not have accurate perceptions of the walkability of the area in which they live.

5.8   Modeling

Two binary logit models ("models that consider two discrete outcomes" (65)) were developed: 1) one which predicted the likelihood that a survey respondent would choose either "Yes" or "Maybe" (e.g., if "Yes" or "Maybe" then 1; if "No" then 0) when asked whether or not they anticipated moving within one year (Question 51), and 2) the second predicted whether or not a survey respondent indicated that they used an automobile for travel in a typical week (e.g., if automobile was chosen, then 1; if automobile was not chosen, then 0) (Question 35). The following two sub-sections discuss these modeling results in detail.

5.8.1 Moving Within 1 Year

A total of 1,712 observations were modeled, in which survey respondents either indicated that they 1) were planning on moving within the year, 2) were maybe going to move within the year, 3) were not planning on moving within the year, or 4) did not provide a response. (Note: Survey

respondents who were not asked this question were removed from the sample.) Researchers were interested in investigating characteristics that describe why a survey respondent may move, as studies have asserted that Millennials prefer urban areas ((19), (44)). Therefore, there was an expectation that the data might show that Millennials living in rural areas would report moving. Table 17 shows the model developed based on the data.

Table 17: Expectation for Moving within One Year

Variable	Estimate	Std. Error	z	Prob. |z|>Z*	Significance
Constant	-1.18420	0.15290	-7.75	0.0000	***
MINN	-0.26635	0.12496	-2.13	0.0330	**
MONT	-0.30094	0.15870	-1.90	0.0579	*
MILL	1.16539	0.11891	9.80	0.0000	***
NOWALK	-0.45310	0.11340	-4.00	0.0001	***
MSA	0.25551	0.11544	2.21	0.0269	**
EMPLOYED	-0.29295	0.11315	-2.59	0.0096	***
Number of Observations = 1,172					
Log Likelihood = -984.22103					
Restricted Log Likelihood = -1057.71390					
Hosmer-Lemeshow Chi-Squared = 5.02050					
Significance codes: 0'***'; 0.001'**'; 0.01'*'; 0.05'.'					

The following is a discussion of the variables.

The model was originally tested with a variable for Washington State in the model. Therefore, all of the state variables were tested against Wisconsin. However, the Washington State variable was not statistically significant. Therefore, it would appear that when considering whether or not one is planning on moving in the near future, survey respondents from Washington State and Wisconsin have similar outlooks in the near future, where it would appear that they reported a greater likelihood for moving. While the statistical significances are lower, Minnesota (MINN), and more so Montana (MONT) survey respondents were less likely to indicate that they planned on moving in the immediate future. This could either mean that these survey respondents are content with their current living situation or it could mean that survey respondents do not envision the possibility of moving – they could feel stuck.

NOWALK represents survey respondents who reported that they "Disagreed" or "Strongly Disagreed" with the statement, "The area where I live is walkable (retail stores and restaurants are within a comfortable walking distance)." The results indicate that survey respondents were less likely to report the expectation of moving in the near future if they reported less walkable areas.

MSA represents metropolitan statistical areas (MSA). The results show that respondents who are categorized as living within MSAs are more likely to move. The results of this model do not pick up on whether or not survey respondents plan to move locally or a longer distance. However, one

possibility is that survey respondents in MSAs may be more likely to move within the area as they move from one rental unit to another.

The final variable, EMPLOYED, represents those survey respondents who indicated that they currently hold a job. This variable might help explain why Millennials in urban areas remain in urban areas. The results of this variable seem to imply that not having a job could increase the propensity to move.

5.8.2 Automobile Use within an Average Week

Survey respondents were asked to identify the modes that they used in an average week (Question 35). One option identified to survey respondents was the automobile. The following model (Table 18) predicts the factors that influence a survey respondent to identify an automobile as a mode used in an average week.

Table 18: Automobile as a Mode Used in an Average Week

Variable	Estimate	Std. Error	z	Prob. |z|>Z*	Significance
Constant	-0.76499	0.78181	-0.98	0.3278	
MONT	0.94358	0.21847	4.32	0.0000	***
MSA	-0.50528	0.16802	-3.01	0.0026	***
SMAGE	0.52544	0.21056	2.50	0.0126	**
MOREJOBS	0.73412	0.32147	2.28	0.0224	**
AWORK	0.87105	0.20305	429	0.0000	***
COST	-0.47209	0.16250	-2.91	0.0037	***
NOWALK	0.96886	0.17647	5.49	0.0000	***
MORECAR	0.80248	0.21488	3.73	0.0002	***
OWN	1.25873	0.18956	6.64	0.0000	***
NEW	-0.51644	0.19163	-2.69	0.0070	***
FREE	-0.45851	0.18584	-2.47	0.0136	**
MANY	0.70290	0.16528	4.25	0.0000	***
WHITE	0.47354	0.17813	2.66	0.0079	***
LOWINC	-0.70004	0.17808	-3.93	0.0001	***
Number of Observations = 2,517					
Log Likelihood = -606.95340					
Restricted Log Likelihood = -774.07123					
Hosmer-Lemeshow Chi-Squared = 28.08824					
Significance codes: 0'***'; 0.001'**'; 0.01'*'; 0.05'.'					

Three variables were included in the original model, so that all of the variables representing states were compared with Wisconsin as the base case. However, with the exception of Montana (MONT), which remains, all other state indicator variables were not statistically significant. In fact, they were not even close to becoming statistically significant. The fact that the Montana variable remains probably reflects both the rural nature of Montana, as discussed while looking at other results, and the fact that compared with other states, congestion is still relatively infrequent. Therefore, it makes sense that there is an increase in the likelihood of vehicle use by those in Montana.

The variable that represented metropolitan statistical areas (MSA) was associated with a decrease in a survey respondent choosing the automobile as one of the weekly modes. This result is expected as those in MSAs can be expected to have more transportation choices.

SMAGE represents the logarithm of the age of a survey respondent. As a survey respondent's age increases, he or she is more likely to identify the automobile as a mode chosen in a typical week. This makes sense, as this would likely represent the Baby Boomers and other older generations, who enjoyed the benefits of the automobile before the congestion that is seen today existed. These generations have also been conditioned to use this mode, as obtaining a driver's license was significantly easier and cheaper than what young people experience today.

Survey respondents who indicated that they worked more than one job (MOREJOBS) were found to be more likely to indicate that they used the automobile as one of the modes of transportation used in an average week. This result is as expected because it is more likely that someone with multiple jobs has less time to get from one job to another. It could also potentially indicate that one works more jobs to afford an automobile, as the cost to own and operate an automobile is expensive.

If survey respondents indicated that they preferred to use an automobile to get to work (AWORK), then they were more than likely to identify an automobile as a mode they used in an average week. As shown in a previous multi-variable analysis (See Section 5.4), survey respondents were not required to, and they in fact did not necessarily choose only modes that they used in an average week as their preferred mode. When looking at the results of preferred mode, the automobile was chosen significantly more frequently as the preferred mode for work, but not for recreation or school. Therefore, the data seems to show that the automobile is seen as the most dependable mode to get to work, when travel time and on-time arrival are vitally important for retaining one's job.

Survey respondents who indicated that cost influenced the mode that they used to travel were less likely to choose an automobile as a mode they used in an average week (COST). Therefore, it seems that these survey respondents correlate the cost of a vehicle with travel.

Those who live in areas that they identified as less walkable (NOWALK) were more likely to choose the automobile as a mode they use in an average week. This result is expected as the automobile is likely the only mode choice available to these survey respondents in their area.

The more vehicles a survey respondent reported having in their household, the more likely the survey respondent reported using an automobile as a mode used in an average week (MORECAR). This result makes sense, as respondents would be likely to use a vehicle if they have access to it, and having more vehicles in the household will likely give them more ability to use this mode if they choose, as compared with households that either do not have vehicles or have many people trying to use a single or fewer vehicles.

The variable with the largest coefficient was associated with vehicle ownership (OWN). Those survey respondents who indicated that they owned a vehicle were more likely to indicate that they used an automobile in an average week. This result makes sense because as mentioned previously, if one is going to invest in the ownership and operating costs of a vehicle, that person will likely want to make use of his or her investment.

Those who indicated that they liked new and different were less likely to choose the automobile as a mode they used in an average week (NEW). This likely shows that people who may be described as more open would be more likely to use modes in an average week that do not include an automobile.

Survey respondents who chose "Describes me very well" when asked to respond to "I value my independence above all else." were less likely to identify using an automobile in an average week (FREE). This result was a bit unexpected, as an automobile is often seen as highly tied with being independent. These results may represent the change in mindset that has become popular in transportation where the car is being discussed as "auto-dependent" and public transportation is described as "car free," as is the case with transit advocates in the Twin Cities (e.g. St. Paul and Minneapolis, MN) Metro Area. In addition, as shown in the results section, Baby Boomers agreed with this statement most strongly; they also indicated using the automobile most frequently. Therefore, it is interesting that this statement was associated with a negative. It could show that the Baby Boomers who chose "Describes me very well" could be a subset that has different viewpoints than the rest of their cohort.

Survey respondents who lived in households with more than two people were more likely to identify the automobile as a mode used in an average week (MANY). It should be noted that a variable representing the number of children in a household was not statistically significant. Therefore, this variable does not seem to relate to the need to chauffeur children. Instead, it could in part be representing households that share one vehicle.

Survey respondents who identified themselves as White/Caucasian were more likely to choose an automobile as one of the modes they used in a weekly basis (WHITE). This would imply that when compared with other races, those who categorize themselves as White/Caucasian typically choose to use an automobile.

Survey respondents who indicated that they made less than $20,000 in a year were less likely to identify an automobile as a mode they used in an average week (LOWINC). This likely reflects the high costs associated with vehicle ownership.

5.9   Summary of Results

The following discusses the results of the survey as compared with findings from the literature review.

5.9.1 Transportation Preferences

The literature and mainstream media have reported various levels of interest by Millennials in non-auto forms of transportation. The results of this study still show a strong preference or use of a private automobile by the majority of survey respondents, more so in rural areas as compared with urban areas (Figure 19, Figure 20, & Figure 21). Furthermore, when looking at the responses from the rural survey respondents of Millennials and Baby Boomers, some of the most notable differences can be seen when comparing the 1) carpool/vanpool, 2) bus, and 3) airplane categories. Millennials report using carpool/vanpool and buses more often than Baby Boomers (Figure 19 & Figure 21). More rural Baby Boomer survey respondents report using an airplane in a typical week as compared with rural Millennials. Airplane travel is an expensive form of transportation. Therefore, these results hint at some of the economic disparity between these two generations. Overall, when compared with other generations, while Millennials do demonstrate the use of a wider variety of modes, they still report preferring and making use of the private automobile most often.

The study by the Vermont Transportation Board suggested that convenience and service hours of public transportation were a barrier to greater use of public transportation by young people in

Vermont (31). The results of this study also showed that the appeal of public transportation to survey respondents and their reported opinion regarding public transportation getting them to where they want to go in a reasonable amount of time showed room for improvement.

Regarding bicycling, it seemed as a whole as if there was less interest and support from survey respondents. In general, Generation X had more of a preference for bicycling as compared with both Millennials and Baby Boomers, particularly for utilitarian purposes. In addition, similar to the results for public transportation, survey respondents did not indicate that being able to bike for everyday transportation was a factor in where they chose to live.

Seventy-five and eighty-seven percent of urban and rural Millennials, respectively, indicated that they preferred to use an automobile to travel to work. While generally consistent, this is greater than the percentage reported by Lachman and Brett (2) (see Table 6). It contradicts what is asserted by Goldberg (19), who suggested that Millennials have an interest in using public transportation to get to work.

Poole (20) suggested that as Millennials enter the workforce, they will prefer an automobile to get to work. The data collected for this study would support this conclusion, as the automobile was clearly the preferred mode when going to work. For shopping and school trips, on the other hand, it appeared that survey respondents were open to other modes. Furthermore, when asked about car ownership, many Millennials reported the expectation of purchasing a vehicle in the next one or two years.

Twenge (4) seemed to suggest that the younger generation's interest in public transportation was to create more opportunities for social interaction. However, from the open comment portion of the survey, some Baby Boomer survey responses (see below) suggest that the younger generation is not the only one with an interest in public transportation as an opportunity to socialize:

"We have no public transportation where I live, and it would be nice to have it to increase the opportunity for visiting, shopping, traveling, and to meet other people."

"It's so I'll be able to see a lot of people walking, and it won't be lonesome."

5.9.2 Higher Education & Student Debt

Student debt was suggested as a reason why Millennials are interested in public transportation. One study reported that in 2006, 66% of individuals aged 35 or younger owed more than $10,000 in student loans; approximately 5% owed more than $100,000 (4). For the present study, approximately 50% of urban Millennials and 40% of rural Millennials reported having student loans. Compare this with about 40% and 37% of urban and rural Generation X survey respondents that had student loans. Therefore, Millennials have more survey respondents reporting loans, particularly in the urban areas. When looking at the largest category of student debt, Generation X had a greater percentage of survey respondents reporting $75,000 or more in student loans when compared with Millennials. Moreover, the percentage for both urban and rural Generation X survey respondents was approximately equal at around 5%. So, while Millennials have a higher percentage of survey respondents reporting that they have student loans, it seems that Generation

X has a higher percentage of survey respondents that are reporting student loans with high balances. One possible explanation for the difference is that more Millennial survey respondents reported that they are still in college, where they can potentially incur more student debt as they work to complete their degree. Generation X could have also accrued more debt pursing degrees beyond a Bachelor's Degree. Having a substantial level of student debt can influence how one chooses to get around. Generation X could also still be recovering from the Recession, which may have limited their job prospects. In addition, they may have worked at jobs in which the pay would have been lower than anticipated in stronger economic periods.

The Nielsen Company (15) reported that 23% of Millennials have a Bachelor's Degree. It is unclear if this includes Millennials that are pursuing or have completed degrees beyond a Bachelor's. If it includes only the former, our data supports this result. If this is the information used to indicate that Millennials are attaining a higher level of education, then the researchers would support this conclusion. However, when compared with other generations, the data collected for this study seems to conclude that Millennials are less educated than the older generations (Figure 11). Overall, the researchers for this study conclude that when a more rural sample of Millennials is incorporated into the analysis, Millennials are not as highly educated as purported in the media.

5.9.3 Technology

The most frequently used social media as reported by survey respondents was Facebook. Approximately seventy-one percent of urban Millennials used Facebook, with about ten percent less rural Millennials reporting using Facebook. Therefore, this study shows that a slightly smaller percentage of Millennials use social media than what was reported in the literature (51). The results were different for Generation X, where more rural Generation X survey respondents reported using Facebook as compared with urban Generation X. In addition, a difference was found between the social media use in rural as compared with urban areas, although greater use was found to switch when comparing the Millennials with Generation X.

Millennials and Generation X were found to report significant differences in their interest in being connected to the internet when compared with Baby Boomers. Furthermore, urban Millennials indicated a stronger preference of staying connected to the internet as compared with their rural counterparts. Therefore, these results seem to agree with what is reported in the literature; however, it also shows that there is a difference between urban and rural Millennials. Again, this could reflect the challenges with cell phone reception in rural environments.

When asked about their valuation of having products with the latest technology, Millennials reported valuing this more as compared with Generation X and Baby Boomers. Therefore, this would imply that Millennials, who have been described as "techno-travelers" (8), see technology as being integral in their lives.

5.9.4 Living Situation & Location

Having transportation options was reported by almost two thirds of Millennials in one article (16) as ranking within one of their top three concerns when considering where to live and another study identified "efficient transportation" as the number one factor in choosing where one lives (19). In this survey when Millennials were asked whether public transportation and facilities to support everyday bicycling influenced where they lived, the results did not seem to support this conclusion (See Section 5.2.4 and Section 5.2.5). The question on the survey for this research was not the same as that in the other studies, which could potentially explain the difference. However, the dissimilarity could also be explained by the difference between stated preference and actual behavior.

When asked about their living situation, it appears from the almost equal percentage of Millennial survey respondents indicating that they lived in two, three and four person households that many Millennials are either living with family or roommates. Since approximately fifty percent of Millennial survey respondents indicated that they do not live in households with children, not all of these two, three and four person households can be attributed to households with children. Moreover, thirty-five percent of survey respondents did indicate that they are living with family or living with roommates. In addition, living with roommates was found to be reported by more survey respondents in urban areas as compared with rural areas. Therefore, again, rural and urban residents can be expected to travel differently.

The literature reported that forty-percent of Millennials reported an interest in living in an urban area in the future. However, the results showed that urban survey respondents were more likely to report an expectation to move as compared with rural survey respondents. Researchers and stakeholders in this study suggest that this could represent those moving within the urban area that they currently occupy, rather than a move from one area to another. Therefore, this sentiment, while it cannot be directly compared, does not seem to be supported by these survey results.

Overall, generations appeared relatively consistent in their valuation of local/authentic experiences. The literature talked about community character as being an important trait for Millennials (2). However, our results imply that the valuation of a local/authentic community does not seem to differ much across generations.

Millennials are purported to desire "new urbanism," "smart growth," or "transit orientated" communities. A significant component of these types of communities is that they are walkable. Therefore, while not directly comparable, researchers can obtain an impression of whether or not Millennials in the survey for this research study might be concluded to desire such types of community. When asked about their current environment, most survey respondents reported that their environments were not walkable, regardless of generation. However, Millennials had the greatest percentage of survey respondents reporting that their environment was walkable. Those that did not report that their environments are walkable could potentially desire to move to more walkable areas. It is difficult to conclude from the questions that were asked whether or not this is the case. It is interesting to note, however, that public transportation and walking were valued above bicycling, considering only active transportation modes. Therefore, it would seem that if better service was provided by public transportation in an area where it could be viewed as accessed safely, that some might have a preference for those types of communities. On the flip

side, when asked whether or not they were in favor of additional public transportation, bicycling or walking provisions, many survey respondents in rural areas often expresses the sentiment that it just did not fit into the rural nature of the community in which they lived. Therefore, it would seem that more specific questions about these types of environments, such as conducted through focus groups, would be needed to draw better conclusions regarding peoples like or dislikes for these types of communities.

5.9.5 Other Lifestyle Travel Influences

Millennials reported the greatest sensitivity to price impacting how they traveled. Therefore, as suggested in literature, cost does seem to be a factor that influences Millennials to use public transportation.

The literature also suggested that Millennials are making use of public transportation out of concern for the environment. Survey respondents to this study showed that Millennials reported expressing concern for the environment to a greater degree as compared with other generations. However, other studies have suggested that a concern for the environment is often associated with youth. Therefore, as the Millennials age, this difference could be negligible.

The literature indicated that 37% of "young people" were out of work or underemployed. Therefore, the age span could extend beyond what was used to define Millennials for this study. Dependent upon the area type, as few as 11% and as many as 17% of Millennials reported being unemployed. This does not include those Millennials who are underemployed.

Twenge (4) reported that GenMe, which according to our definition encompasses some of Generation X, is self-reliant and independent. When asked about their valuation of independence, approximately 5% more of Baby Boomer survey respondents as compared with Millennial survey respondents reported valuing independence. Considering only urban and rural Millennials, rural Millennials reported valuing independence to a greater degree. In contrast, urban Baby Boomers reported valuing independence more than rural Baby Boomers. Therefore, keeping in mind that the question was not posed in the exact same manner, the result from this study would suggest that Millennials may not be as independent as suggested by some. The authors would also suggest this to be the case as it would contradict another trait that is often associated with Millennials, that they are the social generation.

Overall, while in some cases, urban and rural Millennials showed common viewpoints, many times, these two categories differed. As a whole, while Millennials show more of an interest in alternative modes of transportation as compared to the older generational cohorts, particularly the Baby Boomers, there were still a large percentage of Millennials reporting a preference for the automobile. Considering the implications for the future, where the present mode shift has resulted in lots of discussion and research, what kind of impact could Generation Z have on transportation if they adopted non-auto modes to an even greater degree than the Millennials?

6   CONCLUSIONS

The primary objective of this research was to determine if Millennials in small urban and rural communities have the same mobility mindset as those in large, urban areas. After reviewing the available literature and deploying a survey which looks at Millennials' stated preference as compared with other generational cohorts, albeit at a different phase in their life, the researchers conclude that, as a whole, Millennials in small urban and rural communities do not have the same mobility mindset as those in large, urban areas. Table 19 presents a summary of the points discussed.

Table 19: Mobility Mindset of Urban and Rural Millennials, Summary

Mobility Mindset of Urban Millennials	Mobility Mindset of Rural Millennials
• Higher level of educational attainment • Greater number of student loans, with higher values • Higher percentage of annual income earners greater than $150,000 • More of a preference for a smartphone • More multi-modal for average weekly reported travel • Students, tended to attend in person and lived near their institution • Slightly higher percentage of employment • Fewer jobs • More reported valuation of quality over price • More likely to move	• More typical to have a high school diploma or Associate's Degree • Lower number of student loans, with lower values • Higher percentage of annual income earners less than $20,000 • Slightly lower preference for a smartphone • More mono-modal for average weekly reported travel • Students, tended to make use of online offerings • Slightly lower percentage of employment • More jobs • Slightly less valuation of quality over price • Slightly less likely to move

When looking at the results by state, Washington and Minnesota seem to exhibit more similarities as they both have a large urban area (e.g. Seattle and St. Paul/Minneapolis). Montana, in contrast, has many differences that seem to be related to its rural nature. Wisconsin seems to be somewhere in between.

From this survey, the Millennial generation does not appear to be more educated than other generations. Furthermore, it seems that urban Millennials tend to report a higher level of educational attainment as compared with rural Millennials, which would likely contribute to a different mobility mindset. More rural Millennials reported attaining a high school diploma/GED or an Associate's Degree, whereas more urban Millennials reported attaining a Bachelor's Degree, Master's Degree or Doctoral Degree.

About ten percent more rural Millennials reported not having any student loans as compared with urban Millennials. Of those who reported student loans, rural Millennials tended to report smaller amounts of student loans when compared with urban Millennials. Not having to pay off student loans on a monthly basis would potentially allow rural Millennials to have more discretionary

income that could potentially be put towards the purchase of, say for example, a private vehicle. Yet, if survey respondents took out a student loan to start school but did not finish their education, they might instead have the same amount of income combined with more debt, thereby limiting their discretionary income.

More rural Millennial survey respondents than any other category reported earning less than $20,000, the majority of whom live in Montana or Washington. It would be expected that these individuals would have limited mobility options and limited discretionary income, which can be expected to impact their mobility mindset.

The use of a smartphone for travel information was preferred by Millennials and Generation X to a greater degree than the Baby Boomers. Baby Boomers most preferred a desktop or laptop for travel information. However, whereas urban Millennials and urban Generation X survey respondents reported using the smartphone for travel information more than their rural counterparts, rural Baby Boomers indicated a greater use of the smartphone for travel information when compared with urban Baby Boomers.

The automobile was still reported by the largest percentage of survey respondents as a mode used in a typical week. However, this is not surprising considering that the transportation network is designed with the automobile in mind. Millennials, compared with other generations, reported using a wider variety of transportation modes in a typical week. Furthermore, for every generation, there typically tended to be a wider variety of transportation modes used by urban survey respondents when compared with their rural survey respondents.

The preferred mode to work identified by most survey respondents across generations and for both urban and rural was the automobile. The results for trips to school and for recreation were different, particularly for the Millennial generation. One of the most notable variations was that 20% fewer urban as compared with rural Millennial survey respondents reported preferring the automobile to travel to school. Bus and walking were the two other more frequently preferred modes by urban Millennials. Generation X had only about a 15% difference between their urban and rural cohorts regarding the preference for using an automobile to travel to school. More interesting is that a larger percentage of urban Generation X survey respondents reported preferring to use the bus. A little under 10% of Generation X *rural* survey respondents reported preferring to use a bicycle to travel to school. The results for recreational trips were more consistent with those for work-related trips.

More rural survey respondents (Millennials and Generation X) reported being online students as compared with urban survey respondents. Furthermore, rural Millennial survey respondents tended to indicate that they lived a medium distance away from their educational institution whereas urban Millennial survey respondents often reported living in relatively close proximity.

More urban Millennial survey respondents reported being employed than rural Millennial survey respondents; however, approximately the same percentage of Millennials in urban and rural areas reported being unemployed. The difference between urban and rural employed Millennials can likely be attributed to those who are stay-at-home parents. (Note: A larger percentage of survey respondents were female.) Of those employed, more rural Millennials reported working more than one job as compared with their urban counterparts, possibly explaining the need for travel by automobile, especially considering that in rural areas public transportation typically runs less frequently and covers a more limited area.

By far, Facebook was the most frequently used social media. Millennials reported making the most frequent use of Facebook when compared with Generation X and Baby Boomers. For the Millennial generation, those in rural areas reported using Facebook less than those in urban areas. The Baby Boomer generation survey respondents showed a similar pattern. In contrast, rural Generation X survey respondents reported using Facebook more than their urban counterparts.

More Millennials reported preferring to stay connected to the internet than Generation X and Baby Boomers. In addition, more urban Millennials reported that this was important than rural Millennials.

Millennials reported that cost influenced their transportation choices more so than Generation X and Baby Boomers.

Not many survey respondents indicated that they felt where they live is walkable. However, of all of the generations, a greater percentage of Millennials reported living in a walkable area. This could show that as Millennials continue to have more options regarding where they live as they move into more stable periods of employment, they may continue to search out walkable areas.

Survey respondents were asked about their vehicle ownership status. Many more Millennials reported having regular access to someone else's vehicle or having plans to purchase a vehicle in the future. Therefore, this would imply that while many Millennials may not be able to afford a vehicle now, they intend to buy one in the future. This would discount the assertion that Millennials "prefer" public transportation. There is also an indication, based on a greater percentage of rural Millennials indicating that they have plans to purchase a vehicle that rural Millennials rely on a vehicle more as compared with urban Millennials.

Millennials reported valuing quality over price more so than other generations. Urban Millennials reported valuing quality over price more so than rural Millennials.

Somewhat surprising, more urban survey respondents reported the expectation of moving as compared with their rural counterparts. However, this can likely be explained by urbanites moving to a better apartment, moving into their own apartment, changing roommates, getting married, or buying a home.

As discussed above, for the most part, there were clear differences between urban and rural Millennials with respect to educational attainment, student loans, income, use of technology and their expectation for moving. In addition, other generational cohorts demonstrated differences between those residing in urban areas as compared with those residing in rural areas. However, while these differences would seem to imply that alternative options for transportation are not as viable in rural areas as compared with urban areas, the fact that rural Millennial survey respondents reported households with zero vehicles across all area types and that rural Generation X survey respondents had a higher percentage reporting that they preferred a bicycle to travel to school than their urban counterparts suggests that there are opportunities to provide alternatives that people will make use of in rural environments. Furthermore, with a higher number of households in rural areas reporting an annual income of less than $20,000, which likely limits their transportation options, there is clearly a need to consider how to allow these households to access healthcare, education and employment. Yet, as identified in many of the open-ended responses regarding why a survey respondent felt that additional public transportation, bicycling, and walking facilities or provisions were or were not needed, the context of the application must be seriously considered.

7   FUTURE WORK

While this study began the work to uncover an understanding of Millennial wants and needs in rural and small urban areas, there are many research questions that are unanswered. For example, at the beginning of the project, many state DOTs acknowledged that they would like a better understanding of transportation wants and needs of Millennials residing in tribal areas. While some survey respondents reported being Native American, a study focusing specifically on this race would likely help to better understand their needs.

With regard to car travel, the results do not provide a clear understanding if the respondents who own a car can afford to fill up the gas tank. Respondents were also not asked whether or not they had a driver's license. Therefore, while the study provided valuable information regarding Millennials' preference to own a car in the future, there are still more questions to ask about vehicle ownership and use.

Only Millennials eighteen and older were included in this study for several reasons. However, as discussed in the findings of the Literature Review, there are differences between the older and younger individuals within the generational cohort. It is possible that younger individuals (ages 15-17) may report differences as they face the world on their own. Consequently, performing research once those within this age group turn eighteen would be valuable.

Car sharing, Uber, NiceRide (bike share in the Twin Cities Metro Area) are popular with Millennials in the Twin Cities Metro Area. These services are growing in the smaller urban areas. A future research project could look at how the availability of these services may influence Millennial relocation to that area.

The results of this study are drawn from data collected in Minnesota, Montana, Washington, and Wisconsin. It is well documented that there are differences between states regarding mobility preferences. As such, future studies should try to collect data from additional regions (i.e., south and east) to further build on the knowledge regarding transportation preferences. For example, while Minnesota, Montana, Washington State, and Wisconsin survey respondents indicated infrequently utilizing DOT social media, other states, may have different results. For example, it would be interesting to look at New York, which may have enticed users to join DOT social media to receive notifications during extreme weather events like Hurricane Sandy.

APPENDIX A: SURVEY INSTRUMENT

The following presents the survey questions as viewed by survey respondents.

Transportation Preferences

1. Do you live in:
○ Minnesota
○ Montana
○ Washington State
○ Wisconsin
○ Other State (please specify)

2. What is the 5-digit zip code of the area where you currently live?

[Prev] [Next]

Powered by

Transportation Preferences

3. How old are you?

[Prev] [Next]

Powered by
SurveyMonkey®
See how easy it is to create a survey.

Transportation Preferences

4. Are you a student?
○ Yes
○ No

[Prev] [Next]

Powered by
SurveyMonkey®
See how easy it is to create a survey.

Transportation Preferences

5. How many days a week do you typically travel to school?

- ○ 0; I take classes online.
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7

[Prev] [Next]

Powered by
SurveyMonkey®

Transportation Preferences

6. What is the approximate distance you travel _one-way_ from your house to school?

- ○ ≤ 5 miles
- ○ > 5 and ≤ 10 miles
- ○ > 10 and ≤ 15 miles
- ○ > 15 and ≤ 20 miles
- ○ >20 miles

[Prev] [Next]

Powered by
SurveyMonkey®

See how easy it is to create a survey.

Transportation Preferences

7. What is your employment status?

- ○ Employed
- ○ Unemployed
- ○ Retired
- ○ Stay-at-home parent
- ○ Other (please specify)

[   ]

[Prev]   [Next]

Powered by

SurveyMonkey®

See how easy it is to create a survey.

Transportation Preferences

8. How many jobs do you currently hold?

- ○ 1
- ○ 2
- ○ 3
- ○ Other (please specify)

[   ]

[Prev]   [Next]

Powered by

SurveyMonkey®

See how easy it is to create a survey.
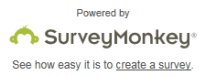
Transportation Preferences

9. How many days do you work in a typical work week?

[▲▼]

10. How many days in a typical week do you travel to work?

[▲▼]

11. On average, how many *hours* do you work in a week?

[   ]

12. What is the approximate distance you travel one-way from your house to work?

○ ≤ 5 miles

○ > 5 and ≤ 10 miles

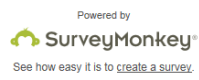○ > 10 and ≤ 15 miles

○ > 15 and ≤ 20 miles

○ >20 miles

Transportation Preferences

13. How do you obtain travel information? (Please select all that apply.)

☐ Department of transportation website

☐ Radio

☐ Department of transportation social media (e.g., Twitter, Facebook)

☐ Tablet using programs like Google Maps or MapQuest

☐ 511

☐ Smartphone application (e.g., Google Maps, Waze, Apple Maps, etc.)

☐ Desktop or lap top computer using programs like Google Maps or MapQuest

☐ Standalone GPS (e.g., Garmin, Tom Tom, Magellan, etc.)

☐ Television

☐ Other (please specify)

[   ]

[Prev]   [Next]

Transportation Preferences

14. Please indicate how frequently you use the following social media.

	Frequently	Sometimes	Rarely	Never
Tumblr	○	○	○	○
LinkedIn	○	○	○	○
Flickr	○	○	○	○
Facebook	○	○	○	○
Snapchat	○	○	○	○
Twitter	○	○	○	○
MySpace	○	○	○	○
Instagram	○	○	○	○

Prev   Next

Powered by

15. In a typical week, which of the following forms of transportation do you use? (Check all that apply)

☐ Taxi

☐ Bicycle

☐ Rideshare (e.g., Lyft, Uber)

☐ Carpool/vanpool

☐ Bus

☐ Walk

☐ Light Rail

☐ Regional/National Rail (e.g., Amtrak, Northstar)

☐ Ferry

☐ Automobile

☐ Carshare (e.g., Car2Go, HOURCAR, Zipcar)

☐ Airplane

☐ Other (please specify)

Prev   Next

Transportation Preferences

16. What is your preferred mode of travel?

	Modes
To work	⬍
To school	⬍
To recreational activities	⬍

Prev   Next

Powered by

SurveyMonkey®

See how easy it is to create a survey.

17. Please indicate your level of agreement with the following statements.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
It is important for me to stay connected to the internet/phone while traveling on a daily basis.	○	○	○	○	○
I feel that I have a variety of transportation options in my community that allow me to get to where I need to go.	○	○	○	○	○
Cost influences how I travel (e.g., by bus, train or car).	○	○	○	○	○
Distance to work influences how I travel (e.g., by bus, train, car).	○	○	○	○	○
Distance to shopping influences how I travel (e.g., by bus, train, car).	○	○	○	○	○
Distance to recreational activities (e.g., running, walking, viewing movies, etc.) influences how I	○	○	○	○	○
Distance to shopping influences how I travel (e.g., by bus, train, car).	○	○	○	○	○
Distance to recreational activities (e.g., running, walking, viewing movies, etc.) influences how I travel (e.g., by bus, train, car).	○	○	○	○	○
I prefer to shop online as compared to shopping in person.	○	○	○	○	○
The area where I live is walkable (retail stores and restaurants are within a comfortable walking distance).	○	○	○	○	○

Prev   Next

Transportation Preferences

18. Please indicate your level of agreement with the following statements about public transportation (e.g., by bus, train) where you live.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Public transportation was an important factor in choosing where I currently live.	○	○	○	○	○
Public transportation is an appealing transportation option in my community.	○	○	○	○	○
Public transportation has stops where I need to go.	○	○	○	○	○
Public transportation can get me where I want to go in a reasonable amount of time.	○	○	○	○	○

Prev   Next

Transportation Preferences

19. Please indicate your level of agreement with the following statements about bicycling where you live.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Being able to bike for everyday travel influenced where I chose to live.	○	○	○	○	○
I chose where I live based on the proximity of leisure bicycling options.	○	○	○	○	○
The presence of bicycle lanes, multi-use paths, and/or bike share make bicycle transportation possible where I live.	○	○	○	○	○

Prev   Next

Powered by

SurveyMonkey®

Transportation Preferences

20. Would you like to see more public transportation (e.g., bus, train) options where you live?

[↕]

21. Why or why not?

[   ]

[Prev] [Next]

Powered by

SurveyMonkey®

See how easy it is to create a survey.

Transportation Preferences

22. Would you like to see more bike lanes, multi-use paths, and/or bike share where you live?

[↕]

23. Why or why not?

[   ]

[Prev] [Next]

Powered by

SurveyMonkey®

See how easy it is to create a survey.
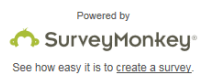
Transportation Preferences

24. Would you like to see more sidewalks where you live?

[▼]

25. Why or why not?

[   ]

[Prev]   [Next]

Powered by

SurveyMonkey®

See how easy it is to create a survey.

Transportation Preferences

26. How many operable vehicle(s) are available for use (e.g., you own, lease or have permission to borrow them) in your household?

[▼]

27. Which of the following best describes your vehicle ownership status or plans?

○ I currently own a vehicle.

○ I currently **lease** a vehicle.

○ I have regular access to a vehicle that someone else in my household owns.

○ I have regular access to a vehicle that someone else in my household **leases**.

○ I don't currently own a vehicle, but I have plans to buy one in the next 1-2 years.

○ I don't currently own a vehicle, but I have plans to **lease** one in the next 1-2 years.

○ I don't currently own a vehicle and have no plans to **lease** or buy one in the immediate future.

[Prev]   [Next]

Transportation Preferences

28. How well does each statement below describe you?

	Describes me very well	Describes me somewhat well	Does not describe me
I like doing things that are new and different	○	○	○
I value my independence above all else	○	○	○
I prefer products that offer the latest in new technology	○	○	○
I seek out places and people that are local/authentic	○	○	○
I care about the environment	○	○	○
I consider myself to be very sociable	○	○	○
I buy based on quality, not price	○	○	○

Prev   Next

Transportation Preferences

29. Do you have internet available in your household?

Prev   Next

Powered by

SurveyMonkey®

See how easy it is to create a survey.

Transportation Preferences

30. How would you describe the area where you _currently_ live?

- ○ Big, dense city
- ○ Big-city suburb
- ○ Lower-density city
- ○ Suburb of lower-density city
- ○ Small city
- ○ Small town
- ○ Outlying rural area

[Prev] [Next]

Powered by
SurveyMonkey
See how easy it is to create a survey.

Transportation Preferences

31. Do you anticipate moving:

	Yes	Maybe	No
Within 1 year?	○	○	○
In 1-2 years?	○	○	○
In 2-3 years?	○	○	○
In 4 or more years?	○	○	○

[Prev] [Next]

Powered by
SurveyMonkey
See how easy it is to create a survey.

Transportation Preferences

32. Including yourself, how many people currently live in your household?

[◆]

33. How many children <u>under</u> the age of 18 live in your household?

[◆]

[Prev]   [Next]

Powered by

SurveyMonkey®

See how easy it is to create a survey.

Transportation Preferences

34. Which of the following best describes your current living situation?

○ Married and living with my spouse

○ Living with a significant other or partner

○ Living with parents or other family members

○ Living with roommates or friends

○ Living alone

[Prev]   [Next]

Powered by

SurveyMonkey®

See how easy it is to create a survey.

Transportation Preferences

35. What is your gender?

○ Male

○ Female

Other (please specify)

[   ]

[Prev]   [Next]

Powered by

SurveyMonkey®

See how easy it is to create a survey.

Transportation Preferences

36. With which racial group(s) do you most closely identify? (Please select as many as are applicable.)

- [ ] American Indian/Alaska Native
- [ ] Asian
- [ ] Black/African American
- [ ] Native Hawaiian or other Pacific Islander
- [ ] White/Caucasian
- [ ] Decline to answer
- [ ] Other (please specify)

  [   ]

37. Are you of Hispanic or Latino origin or descent?

- ( ) Yes, Hispanic or Latino
- ( ) No, not Hispanic or Latino
- ( ) Decline to answer

Transportation Preferences

38. What is the highest level of education that you have completed?

- ( ) 8th grade
- ( ) Some high school
- ( ) High school diploma/GED
- ( ) Some college
- ( ) Associate's degree
- ( ) Bachelor's degree
- ( ) Master's degree
- ( ) Doctoral degree

[Prev] [Next]

Powered by
SurveyMonkey®

Transportation Preferences

39. How much do you owe in <u>student</u> loans today?

- ○ I don't have student loans.
- ○ $1 to $5,000
- ○ $5,000 to $9,999
- ○ $10,000 to $19,999
- ○ $20,000 to $49,999
- ○ $50,000 to $74,999
- ○ $75,000 or more
- ○ Prefer not to answer

[Prev] [Next]

Powered by
SurveyMonkey®

Transportation Preferences

40. What is your annual <u>household</u> income?

- ○ Less than $20,000
- ○ $20,000 to $49,999
- ○ $50,000 to $74,999
- ○ $75,000 to $99,999
- ○ $100,000 to $149,999
- ○ $150,000 or more
- ○ Prefer not to answer

[Prev] [Next]

Powered by
SurveyMonkey®
See how easy it is to create a survey.

Transportation Preferences

41. Please share with us any additional comments regarding this research.

Prev   Next

Powered by

SurveyMonkey®

See how easy it is to create a survey.

APPENDIX B: SSI'S

The following pages provided information regarding SSI's sampling method.

ESOMAR 28

The primary aim of these 28 Questions is to increase transparency and raise awareness of the key issues for researchers to consider when deciding whether an online sampling approach is fit for their purpose. Put another way, the aim is to help researchers to ensure that what they receive meets their expectations. The questions are also designed to introduce consistent terminology for providers to state how they maintain quality, to enable buyers to compare the services of different sample suppliers. Notes on the context of the questions explain why the questions should be asked and which issues researchers should expect to be covered in the answer.

These new questions replace ESOMAR's "26 Questions to help Research Buyers of Online Samples". ESOMAR has updated the text to recognize the ongoing development of techniques. While some of the questions remain constant, new questions have been added to incorporate new techniques and new technology in this area. In particular, this revision recognises the broad trend within the industry to build online samples from multiple sources rather than relying on a single panel.

It should be noted that these 28 Questions focus on the questions that need to be asked by those buying online samples. If the sample provider is also hosting the data collection you will need to ask additional questions to ensure that your project is carried out in a way that satisfies your quality requirements.

The 28 Questions complement ESOMAR's Guideline to Online Research which was revised in 2011 to add updated legal and ethical guidance and new sections on privacy notices, cookies, downloadable technology and interactive mobile.

COMPANY PROFILE

1. **What experience does your company have in providing online samples for market research?**
    Context: This answer might help you to form an opinion about the relevant experience of the sample provider. How long has the sample provider been providing this service and do they have for example a market research, direct marketing or more technological background? Are the samples solely provided for third party research, or does the company also conduct proprietary work using their panels?

SSI, founded in 1977, was the first company to make random sample available to researchers and invented the random sampling telephone methodologies which are still considered the gold standard today. SSI has offered online sample for over 15 years. With its roots in the methodology of random telephone sample, SSI is the only provider to offer sample across the full range of modes, including telephone (both fixed/landline and wireless/mobile) address-based, mail, face-to-face, online, mobile and mixed access and mixed mode sampling. SSI is therefore uniquely positioned to recommend the best methodology for each research project.

SSI offers the broadest reach in global sample available as well as global telephone data collection services. SSI partners with researchers to conduct more than 23 million online interviews a year. The resulting deep sampling and data collection expertise enables SSI to provide consultation for each stage of the process—including sample methodology, questionnaire design as it relates to the participant experience, contact methods and rewards—ensuring that the right people complete the questionnaire carefully and attentively.

SSI has decades of experience with trackers, diaries, blogs, online bulletin boards and more, and is the sampling provider chosen by more than 3000 clients including universities, political polling and consumer and business-to-business researchers, as well as the top 50 research organizations. SSI provides sample across 72 countries, and has 26 offices spanning every time zone and staff fluent in 36 languages.

ESOMAR 28

SAMPLE SOURCES AND RECRUITMENT

2. **Please describe and explain the type(s) of online sample sources from which you get respondents. Are these databases? Actively managed research panels? Direct marketing lists? Social networks? Web intercept (also known as river) samples?**

    Context: The description of the types of sources a provider uses for delivering an online sample will provide insight into the quality of the sample.

    SSI's 34 proprietary panels across the globe are at the core of SSI's online sample. Since SSI's research shows that only certain types of people want to join an online panel, SSI improves the quality and representative nature of its online sample by incorporating participants from online communities, social networks, and websites of all types. SSI's sample recruitment is quite different from the simple "river" approach: participants are invited via banners, invitations and messaging of all types, but then go through rigorous quality controls before being included in any sample.

    SSI can potentially access anyone online via a network of relationships with websites, panels, communities and social media groups. SSI's goal is to provide access to people to give their opinions wherever they are in the way that best suits the needs of the research project.

3. **If you provide more than one type of sample source: How are the different sample sources blended together to ensure validity? How can this be replicated over time to provide reliability? How do you deal with the possibility of duplication of respondents across sources?**

    Context: The variation in data coming from different sources has been well documented. Overlap between different panel providers can be significant in some cases and de-duplication removes this source of error, and frustration for respondents.

    Because sources are not only different from each other, but can also change over time, SSI uses a combination of personality and psychographic characteristics to understand and identify the underlying traits which make a difference in the way people answer survey questions. By controlling the characteristics of people within the sample, based on asking them a short set of key questions, SSI has been able to make available to the market a sample blend which is exceptionally consistent, when measured by comparison with external benchmarks, including telephone sample studies and Industry Measures such as the Grand Mean. The Grand Mean auditors commented that "SSI has clearly demonstrated an ability to be consistent in more markets than any other company." The SSI Blend is continuously monitored and calibrated by a dedicated team of methodologists and analysts.

    SSI uses a suite of controls to ensure duplicates are not present in any online sample and to ensure the quality of survey data.

4. **Are your sample source(s) used solely for market research? If not, what other purposes are they used for?**

    Context: Combining respondents from sources set up primarily for different purposes (like direct marketing for example) may cause undesirable survey effects.

    SSI does not conduct any direct marketing or allow any of its proprietary panels to be used for direct marketing. Since research shows that the appeal of joining a research panel is limited, SSI improves the breadth and

ESOMAR 28

representative nature of its sample by including additional sources of all types within its sample blend, including sources which have a direct marketing purpose. SSI's recruitment practice is to include a multitude of diverse sources to minimize bias. SSI also engages in complete transparency with clients, and any potential for source effect can be fully discussed at the sample planning stage.

5. **How do you source groups that may be hard to reach on the internet?**

    Context: Ensuring the inclusion of hard-to-reach groups on the internet (like ethnic minority groups, young people, seniors etc.) may increase population coverage and improve the quality of the sample provided.

SSI works with communities of interest of all types to incorporate rare populations into the online sample blend. Recognizing that motivations may be very different across different demographic groups, SSI's methodology allows participants to be rewarded in the way that makes most sense for them, so that the survey-taking experience will be satisfying to them and they will want to come back and take another survey again in the future. By leveraging relationships with appealing, well-known brands, SSI uses loyalty mechanisms relevant to difficult-to-reach populations.

SSI also realizes that online may not be the best solution for every project. SSI is methodology-neutral, and able to assist clients in understanding the tradeoffs of each method and recommending the best methodology for the specific research need.

6. **If, on a particular project, you need to supplement your sample(s) with sample(s) from other providers, how do you select those partners? Is it your policy to notify a client in advance when using a third party provider?**

    Context: Many providers work with third parties. This means that the quality of the sample is also dependent on the quality of sample providers that the buyer did not select. Transparency is essential in this situation. Overlap between different providers can be significant in some cases and de-duplication removes this source of error, and frustration for respondents. Providers who observe process standards like the ISO standards are required to give you this information.

All partners providing significant sample for SSI's sample blend must go through SSI's Certification Process before being used for any client project. SSI monitors vendor respondent quality over time and does not enter - nor continue - with sources who cannot maintain consistently excellent scores.

The Certification Process includes the fielding of test surveys to assess the quality of the participants and their responses, including a number of proprietary Quality Control checks. Providers are also required to submit documentation describing participant recruitment, management and reward practices.

SSI always notifies a client in advance if requested when sample from a source not managed by SSI is used.

SAMPLING AND PROJECT MANAGEMENT

7. **What steps do you take to achieve a representative sample of the target population?**

    Context: The sampling processes (i.e. how individuals are selected or allocated from the sample sources) used are the main factor in sample provision. A systematic approach based on market research fundamentals may increase sample quality.

Offices worldwide | info@surveysampling.com | surveysampling.com |3

ESOMAR 28

This process starts with understanding exactly what the target population is. Participants are selected from SSI's online sample stream, a consistently managed, diverse and large frame. To minimize the risk of bias, SSI uses a three-stage randomization process in matching a participant with a survey they are likely to be able to complete. First, participants are randomly selected from SSI's panels to be invited to take a survey, and these participants are combined with others entering SSI's SSI Dynamix[TM] sampling platform after responding to online messaging. A set of profiling questions is randomly selected for them to answer. (These are methodologically correct questions, never affirmation questions) and upon completion, participants are matched with a survey they are likely to be able to take, using a further element of randomization.

8. **Do you employ a survey router?**

   Context: A survey router is a software system that allocates willing respondents to surveys for which they are likely to qualify. Respondents will have been directed to the router for different reasons, perhaps after not qualifying for another survey in which they had been directly invited to participate, or maybe as a result of a general invitation from the router itself. There is no consensus at present about whether and how the use of a router affects the responses that individuals give to survey questions.

Yes, routing is a component of the SSI Dynamix[TM] sampling platform. SSI sees many benefits in the use of a well-designed and carefully-managed router. Routers can provide a much better participant experience, which results in a larger available sampling frame; they allow sample providers to better meet the low-incidence, scarce-population and short-field-time needs of today's researchers; and routers greatly minimize the risk of self-selection bias.

9. **If you use a router: Please describe the allocation process within your router. How do you decide which surveys might be considered for a respondent? On what priority basis are respondents allocated to surveys?**

   Context: Biases of varying severity may arise from the prioritization in choices of surveys to present to respondents and the method of allocation.

SSI's router was designed from the point of view of improving the participant experience, since the biggest source of dissatisfaction among participants is being turned away from surveys we have asked them to take for us. Since participant dissatisfaction leads to smaller sampling frames and risks participant fatigue and satisficing, a properly-designed router provides real quality benefits.

Multi-stage randomization is incorporated into the SSI Dynamix[TM] sample platform routing. Participants are randomly assigned to a series of profiling questions. Based on their answers, they are assigned, again using a randomization factor, to a survey they are likely to be able to take. Other factors considered in the assignment include the likelihood that they will be able to complete the survey and the characteristics of the specific study, including factors such as field time and incidence.

10. **If you use a router: What measures do you take to guard against, or mitigate, any bias arising from employing a router? How do you measure and report any bias?**

    Context: If Person A is allocated to Survey X on the basis of some characteristic then they may not be allowed to also do Survey Y. The sample for Survey Y is potentially biased by the absence of people like Person A.

■ ESOMAR 28

While bias is inherent in every router, it is minimized when the router contains a large volume of diverse projects. (A router with only a few projects, where the research topic or target population is closely correlated has an increased risk of bias.) The risk of bias is again minimized if the router is managed system-wide by a dedicated team and closely monitored for consistency.

SSI ran a test of 43 real client projects, both with the SSI Dynamix™ sample platform router and without any router. No evidence was found that the router caused differences in the data obtained. In 36 of the 43 cases, there was no difference at all in the data, and in the remaining cases, the differences were attributable to other factors such as seasonality. A detailed White Paper on these tests is available from SSI.

Several SSI methodologists and analysts have been invited to take part in developing Industry Best Practices for routers and are active on industry Task Forces and Committees on this topic.

The potential for bias introduced by routers must be weighed against biases occurring in a non-router environment, within which participants self-select from a number of individual survey invitations in their inbox. With a router, that self-selection bias, and additional potential biases caused by invitation wording, reward or survey topic are absent.

11. If you use a router: Who in your company sets the parameters of the router? Is it a dedicated team or individual project managers?

> **Context:** It may be necessary to try to replicate your project in the future with as many of the parameters as possible set to the same values. How difficult or easy will this be?

This responsibility and ownership is firmly in the hands of a dedicated team; individual project managers do not have access to the controls. This is important because integrity of the sample must override any immediate demands of an individual project.

Since SSI has a sample blend which is controlled for consistency by underlying characteristics of participants, and the consistency of the blend is constantly monitored and calibrated using external benchmarks, clients can expect consistent sample over time. In addition to blend controls, the combination of source types is also carefully monitored for tracking studies.

12. What profiling data is held on respondents? How is it done? How does this differ across sample sources? How is it kept up-to-date? If no relevant profiling data is held, how are low incidence projects dealt with?

> **Context:** The usefulness to your project of pre-profiled information will depend on the precise question asked and may also depend on when it was asked. If real time profiling is used, what control do you have over what question is actually asked?

SSI holds profiled information on all participants. The methodology and process is the same whatever the sample source. Profiling is important in providing a good participant experience by avoiding repetitive questions. SSI profiling selects include ailments, hobbies and lifestyles, product ownership, media consumption, auto ownership, travel, shopping habits, purchase intent by category, business titles and responsibility and employer profile information as well as deep demographic and geographic profiles.

ESOMAR 28

SSI fields only methodologically sound profiling questions, never affirmation questions, and the precise wording of any profiling question is always available upon request. In the tradeoff between profiling accuracy and excluding eligible participants, SSI will always err on the side of ensuring all eligible participants are available for selection.

Each profiling question is stored in a library, managed by a dedicated team, and each question has an expiration date. For example, a question asking if someone likes to play golf will not be updated as frequently as one asking if someone has a current sports injury. Once again, there is a tradeoff between burdening participants with too many profiling questions and maintaining updated data. The collection date range for any profile item is configurable and can be discussed at the sample planning stage.

13. **Please describe your survey invitation process. What is the proposition that people are offered to take part in individual surveys? What information about the project itself is given in the process? Apart from direct invitations to specific surveys (or to a router), what other means of invitation to surveys are respondents exposed to? You should note that not all invitations to participate take the form of emails.**

   Context: The type of proposition (and associated rewards) could influence the type of people who agree to take part in specific projects and can therefore influence sample quality. The level of detail given about the project may also influence response.

SSI uses invitations of all types to bring in people with a diversity of motivations to take part in research. These include e-mail invitations, SMS and text messages, telephone alerts, banners and messaging on web sites and online communities. The messages themselves are also varied, including invitations to give your opinion, win a prize, earn cash or prizes or let your voice be heard. A diversity of motivation contributes to high-quality sample.

To avoid self-selection bias, specific project details are not generally included in the invitation. Rather, participants are invited to "take a survey". The details are disclosed later, when a survey has been selected for them to take within the system.

14. **Please describe the incentives that respondents are offered for taking part in your surveys. How does this differ by sample source, by interview length, by respondent characteristics?**

   Context: The reward or incentive system may impact on the reasons why people participate in a specific project and these effects can cause bias to the sample.

SSI offers great diversity in incentive as another means to increase diversity of sample frames. Some people are motivated by cash, or points, prizes or sweepstakes or by being able to donate to charity. Others are motivated by the chance to make a difference, make their voice heard, have fun taking a survey, helping out, or having a say in the products and services of the future. Others are motivated by learning opportunities provided by the survey, or by the promise of receiving information. SSI aims to respond to all of these individual motivations, in order to provide a sample which is diverse and as representative as possible of the target population.

Rewards offered may vary by survey length and the characteristics of the population being targeted. SSI uses a reasonable level of reward based on the amount of effort required, the population, and appropriate regional customs.

SSI continues to invest in research-on-research into the motivations of online research participants, and continually adjusts its reward offerings based on these findings, and on current academic thinking about motivation and industry best practices

◼ ESOMAR 28

⬧SSI®

15. What information about a project do you need in order to give an accurate estimate of feasibility using your own resources?

Context: The "size" of any panel or source may not necessarily be an accurate indicator that your specific project can be completed or completed within your desired time frame.

We will need to know 1) Who you wish to speak to; 2) What you will ask of them and 3) How much time is available to gather the data. The first item incorporates geography, demographics, incidence and quota structures and the number of completed interviews required; the second covers the length of the survey, any special tasks required, the questionnaire design and completion difficulty for the participants; the third defines the fielding period, which will impact feasibility.

16. Do you measure respondent satisfaction? Is this information made available to clients?

Context: Respondent satisfaction may be an indicator of willingness to take future surveys. Respondent reactions to your survey from self-reported feedback or from an analysis of suspend points might be very valuable to help understand survey results.

Yes, this is measured for every participant for every completed interview. The results are made available at the end of each project as a standard part of SSI's "Project Debrief Pack." SSI supports high quality questionnaire design by underwriting a series of awards called the Quest Awards, which are handed out every year at the ESOMAR Annual Congress. The questionnaire programmer and researcher are rewarded for their efforts to provide a good participant experience.

SSI's Engagement Team is dedicated to providing a positive participant experience. The team responds quickly to participant inquiries and takes immediate action to resolve any issues of dissatisfaction.

17. What information do you provide to debrief your client after the project has finished?

Context: One should expect a full sample provider debrief report, including gross sample, start rate, participation rate, drop-out rate, the invitation/contact text, a description of the field work process, and so on. Sample providers should be able to list the standard reports and metrics that they make available.

SSI's Standard Project Debrief Pack provides basic project information. Additional information is stored and available on request.

DATA QUALITY AND VALIDATION

18. Who is responsible for data quality checks? If it is you, do you have in place procedures to reduce or eliminate undesired within survey behaviours, such as (a) random responding, (b) Illogical or inconsistent responding, (c) overuse of item non-response (e.g. "Don't Know") or (d) speeding (too rapid survey completion)? Please describe these procedures.

Context: The use of such procedures may increase the reliability and validity of the survey data.

Sources used by SSI undergo a Certification Program which includes a series of quality control questions fielded with the source's sample. Sources whose participants do not perform well are not included in SSI's sample. Quality Control questions are incorporated into the questions which participants see as they are being profiled. SSI also

Offices worldwide | info@surveysampling.com | surveysampling.com |7

ESOMAR 28

works closely with clients, marking the ID of any participant who has been reported to SSI as a potential problem participant.

Both SSI's own research-on-research and multiple industry studies have concluded that questionnaire design is the biggest factor in poor quality response. For example the ARF Foundations of Quality Study into 17 online panel sources found that bad respondent behavior is 6 times as likely to happen in a long survey compared to a short one. SSI can provide consultation on the questionnaire designs most likely to provide a good participant experience and maximize attention.

If quality control questions are used incorrectly, they risk introducing bias to the data. SSI can provide advice on the best type of questions to use and how to use them, based on our own research and industry best practices.

19. **How often can the same individual be contacted to take part in a survey within a specified period whether they respond to the contact or not? How does this vary across your sample sources?**

    Context: Over solicitation may have an impact on respondent engagement or on self-selection and non-response bias.

Solicitation limits vary across the hundreds of sources which make up SSI's sample stream. Some restrictions are "hard" limits, others "soft" guidelines. This diversity of solicitation level increases the diversity of sample and improves its ability to reflect the target population. Restricting solicitation, however, must be weighed against the risk of bias in excluding certain people from a survey solely based on their receipt of a previous solicitation. The sample stream is closely monitored and tested for consistency to ensure that neither solicitation frequency nor any other factor is causing unexpected change.

20. **How often can the same individual take part in a survey within a specified period? How does this vary across your sample sources? How do you manage this within categories and/or time periods?**

    Context: Frequency of survey participation may increase the risk of undesirable conditioning effects or other potential biases.

Participation limits vary across the hundreds of sources which make ups SSI's sample stream. Some restrictions are "hard" limits, others "soft" guidelines. This diversity of participation level increases the diversity of sample and improves its ability to reflect the target population. Restricting participation, however, must be weighed against the risk of bias in excluding certain people from a survey solely based on their previous participation. The sample stream is closely monitored and tested for consistency to ensure that neither resting nor any other factor is causing unexpected change.

Participants can be excluded from projects based on previously participation in or completion of, any specific previous study on request.

21. **Do you maintain individual level data such as recent participation history, date of entry, source, etc., on your survey respondents? Are you able to supply your client with a project analysis of such individual level data?**

    Context: This type of data per respondent including how the total population is defined and how the sample was selected and drawn, may increase the possibilities for analysis of data quality.

Yes, this is maintained and available on request.

ESOMAR 28

22. Do you have a confirmation of respondent identity procedure? Do you have procedures to detect fraudulent respondents? Please describe these procedures as they are implemented at sample source registration and/or at the point of entry to a survey or router. If you offer B2B samples what are the procedures there, if any?

Context*: Confirmation of identity can increase quality by decreasing multiple entries, fraudulent panellists etc.*

To prevent duplication, the SSI Verify suite of quality controls includes both a best-in-class capability and additional identity controls developed by SSI.
To confirm identity, SSI employs a third party data validation service which compares respondent demographics to multiple databases and data vendors specialising in consumer information to confirm key data including name, address and date of birth.

SSI uses additional controls to minimize the risk of fraud by mining observational data to predict and understand how fraud is perpetrated; partnering with reward partners to implement safeguards and to develop rewards which are not as attractive to fraudsters; leveraging technology to automate fraud prevention; and requiring two pieces of verifiable identity information before rewards can be claimed. SSI also employs validation products on request.

Following the success of the techniques SSI has developed, SSI has been consulted by other sample providers and panel owners for guidance in combating this industry-wide issue.

POLICIES AND COMPLIANCE

23. Please describe the 'opt-in for market research' processes for all your online sample sources.

Context: *The opt-in process indicates the respondents' relationship with the sample source provider. The market generally makes a distinction between single and double opt-in. Double opt-in refers to the process by which a check is made to confirm that the person joining a panel or database wishes to be a member and understands what to expect (in advance of participating in an actual survey for a paying client).*

Everyone who takes surveys within the SSI Dynamix™ system has been engaged or invited to take part in research, and has agreed to give their opinions. All communications clearly communicate expectations for participation.

24. Please provide a link to your Privacy Policy. How is your Privacy Policy provided to your respondents?

Context: *Not complying with local and international privacy laws might mean the sample provider is operating illegally. An example privacy policy is given in the ESOMAR Guideline for Online Research.*

Click to view SSI's Privacy Policy. SSI's General Counsel periodically reviews SSI's privacy policy. The policy is prominently displayed to participants; members of SSI's managed communities and panels are alerted to any changes.

SSI staff serve on industry committees working to maintain and develop best practices for privacy. SSI strives to achieve the highest level of privacy and data protection compliance, not only because it is required by laws and regulations, but because it is an essential element in our relationship with participants. Data quality is improved when participants are confident that their personally-identifiable information is protected. Best practices are reinforced at SSI via policies, procedures and training.

Offices worldwide | info@surveysampling.com | surveysampling.com |9

ESOMAR 28

25. Please describe the measures you take to ensure data protection and data security.

Context: The sample provider usually stores sensitive and confidential information on panellists and clients in databases. These data need to be properly secured and backed-up, as does any confidential information provided by the client. The sample provider should be able to provide you with the latest date at which their security has been evaluated by a credible third-party

All panelist and respondent information is secured via industry standard firewalls and stringent IT security policies and procedures. All computer equipment (servers, SANs, switches, routers, etc.) is redundant and is located in secure, environmentally controlled data centers with 24/7 monitoring. Access is restricted and requires authorization.

Access to participant data is restricted by password and staff job function. Access is limited to secure company networks or secure VPN. Access to databases and associated backup files is restricted by IT job function and role. Password-protected database roles further restrict data access and force any data modification to be done through the application layer only. All database connections are logged. Web traffic does not directly access the database and database requests are reversed proxy via an application server to the database.

SSI staff adhere to strict guidelines to prevent sharing of any information across projects or clients. For example, if a project moves from one research provider to another, no information will be shared to the second provider without the express written permission of the original research sponsor. All SSI employees must sign a confidentiality agreement upon joining the company which outlines the employee's obligations to protect company and client confidential information.

26. What practices do you follow to decide whether online research should be used to present commercially sensitive client data or materials to survey respondents?

Context: There are no foolproof methods for protecting audio, video, still images or concept descriptions in online surveys. In today's social media world, clients should be aware that the combination of technology solutions and respondent confidentiality agreements are "speed bumps" that mitigate but cannot guarantee that a client's stimuli will not be shared or described in social media.

SSI is highly experienced in supporting research projects with extremely sensitive material and regularly provides consultation to researchers on best practices in this area. There are a number of techniques which can discourage leaks, including disabling of copying and screen grabs, removal of images after a timed period, and special wording to the participant along with an "I agree not to share information". However there is no guarantee that sensitive information can be kept confidential online, (it is easy to take a photo of the screen with a cell phone for example) and SSI may recommend an in-person interview as a better option for extremely sensitive material.

27. Are you certified to any specific quality system? If so, which one(s)?

Context: Being certified may require the supplier to perform tasks in a pre-determined manner and document procedures that should be followed.

SSI is ISO Certified to Standard 20252, the standard for Market, Opinion and Social Research in its Sydney, Australia office, based on standard SSI procedures.

SSI's telephone methodology, which was the foundation for its online sampling methodology, has been audited and verified by the Media Ratings Council. SSI is the recipient of multiple product and service awards such as the

ESOMAR 28

28. Do you conduct online surveys with children and young people? If so, do you adhere to the standards that ESOMAR provides? What other rules or standards, for example COPPA in the United States, do you comply with?

Context: The ICC/ESOMAR International Code requires special permissions for interviewing children. These are described in the ESOMAR Online Research Guideline. In the USA researchers must adhere to the requirements of the Children's Online Privacy Act (COPPA). Further information on legislation and codes of practice can be found in Section 6 of ESOMAR's Guideline for Online Research.

SSI adheres to applicable laws and codes relating to the protection of children's privacy, including the United States Children's Online Privacy Protection Act (COPPA) and ESOMAR association guidelines.

8   REFERENCES

1. **Rive, G., et al.** *Public transport and the next generation.* Wellington : NZ Transport Agency, 2015. 569.

2. **Lachman, Leanne M and Brett, Deborah L.** *Generation Y: America's New Housing Wave.* Washington, D.C. : Urban Land Institute, 2011.

3. **Fry, Richard.** Millennials overtake Baby Boomers as America's largest generation. *FACTANK: News in the Numbers.* [Online] Pew Research Center, April 25, 2016. [Cited: September 23, 2016.] http://www.pewresearch.org/fact-tank/2016/04/25/millennials-overtake-baby-boomers/.

4. **Twenge, J M.** *Generation Me: Why Today's Young Americans Are More Confident, Assertive, Entitled - and More Miserable Than Ever Before.* New York : Simon & Schuster, Inc., 2006.

5. **Martin, John.** *Generation Y Urban Revolution.* s.l. : Southeastern Institute of Research, 2012.

6. **Sakaria, Neela and Stehfest, Natalie.** *Millennials & Mobility: Understanding the Millennial Mindset.* 2013.

7. **Institute of Mobility Research.** *Mobility Y - The Emerging Travel Patterns of Generation Y.* Munich : Institute of Mobility Research, 2013.

8. *The Travel Habits of Generation Y.* **Schwieterman, Joseph.** 5, s.l. : American Planning Association, 2011, Vol. 77.

9. **Six Principles of Livability.** *United States Department of Transportation* **. [Online] March 5, 2015. http://www.dot.gov/livability/101.**

10. **American Public Transportation Association. Millennial Generation Desires Multi-Modal Transportation System. [Online] October 1, 2013. [Cited: September 9, 2014.] http://www.apta.com/mediacenter/pressreleases/2013/Pages/131001_Millennials.aspx.**

11. **Pool, Jeremy. How Will Millennials Transform Transportation?** *DMV Blog.* **[Online] July 18, 2014. [Cited: September 9, 2014.] https://www.dmv.com/blog/how-will-millennials-transform-transportation-520602.**

12. **Whaley, Monte. Millennial Generation Looking for New Means of Transportation.** *Denver Post.* **[Online] May 14, 2013. [Cited: September 9, 2014.] http://www.denverpost.com/ci_23241511/study-new-generation-spurning-cars-and-trucks.**

13. **U.S. Department of Transportation. U.S. Driving Tops 3.1 Trillion Miles in 2015, New Federal Data Show.** *U.S. Department of Transportation, Federal Highway Administration.* **[Online] U.S. Department of Transportation, February 22, 2016. [Cited: September 23, 2016.] https://www.fhwa.dot.gov/pressroom/fhwa1607.cfm.**

14. **Neff, Jack. Is Digital Revolution Driving Decline in U.S. Car Culture? [Online] May 31, 2010. [Cited: May 20, 2015.] http://adage.com/article/digital/digital-revolution-driving-decline-u-s-car-culture/144155/.**

15. **Nielsen. Millennials Prefer Cities to Suburbs, Subways to Driveways.** *Nielsen.* **[Online] March 4, 2014. [Cited: September 9, 2014.] http://www.nielsen.com/us/en/insights/news/2014/millennials-prefer-cities-to-suburbs-subways-to-driveways.html.**

16. Casey, Colleen. **Millennial Living: What Cities and Features Attract This Generation.** *Life Cheat Sheet Website.* [Online] May 4, 2014. [Cited: September 9, 2014.] http://www.cheatsheet.com/life/millennial-living-what-cities-and-features-attract-this-generation.html/?a=viewall.

17. Beckerman, Samantha. **Access Over Ownership: Millennials and Public Transportation.** *Switchboard: Natural Resources Defense Council Staff Blog.* [Online] January 17, 2013. [Cited: September 9, 2014.] http://switchboard.nrdc.org/blogs/sbeckerman/access_over_ownership_millenni.html.

18. Filisko, G.M. **How Millennials Move: The Car-Less Trends.** *National Association of Realtors Website.* [Online] August 2, 2012. [Cited: September 9, 2014.] http://www.realtor.org/articles/how-millennials-move-the-car-less-trends.

19. Goldberg, David. **Survey: To Recruit and Keep Millennials, Give Them Walkable Places with Good Transit and Other Options.** *Transportation For America Blog.* [Online] April 22, 2014. [Cited: September 9, 2014.] http://t4america.org/2014/04/22/survey-to-recruit-and-keep-millennials-give-them-walkable-places-with-good-transit-and-other-options/.

20. Poole, Bob. **VMT Growth and the Millennial Generation.** *Jefferson Policy Journal.* [Online] June 27, 2013. [Cited: September 9, 2014.] http://www.jeffersonpolicyjournal.com/?p=3693.

21. Smialek, Jeanna. **College Debt Leaves Generation X Grads Less Wealthy Than Parents.** [Online] September 18, 2014. [Cited: September 19, 2014.] http://www.bloomberg.com/news/2014-09-18/college-debt-leaves-generation-x-grads-less-wealthy-than-parents.html.

22. Williams, Parker. **Millennial Behaviors Impacting Transportation.** *Xerox Blogs.* [Online] January 8, 2014. [Cited: September 9, 2014.] http://www.usatoday.com/story/opinion/2014/05/04/peter-varga-millennials-transportation/8577831/.

23. Varga, Peter. **Millennials Shifting Commuter Trends: Column.** *USA Today.* [Online] May 4, 2014. [Cited: September 9, 2014.] http://www.usatoday.com/story/opinion/2014/05/04/peter-varga-millennials-transportation/8577831/.

24. Cisco. **Cisco Study Finds Telecommuting Significantly Increases Employee Productivity, Work-Life Flexibility and Job Satisfaction.** [Online] June 25, 2009. http://newsroom.cisco.com/dlls/2009/prod_062609.html?print=true.

25. *Generation Y Mobilities Through the Lens of Energy Cultures: A Preliminary Exploration of Mobility Cultures.* Hopkins, D. and Stephenson, J. s.l. : Journal of Transport Geography, 2014, Vol. 38.

26. *Decomposing Young Germans' Altered Car Use Patterns.* Kuhnimhof, T, Wirtz, M and Manz, W. 2320, Washington, D.C. : Transportation Research Board of the National Academies, 2012, Transportation Research Record: Jounral of the Transportation Research Board, pp. 64-71.

27. *Generation Y's Travel Behavior and Perceptions of Walkability Constraints.* **Kamargianni, Maria and Polydoropoulou, Amalia. Washington, D.C. : Transportation Research Record, 2014, Vol. 2430.**

28. Davis, Benjamin, et al. *Transportation and the New Generation: Why Young People Are Driving Less and What it Means for Transportation Policy.* **2012.**

29. Pew Research Center. *Millennials, A Portrait of Generation Next, Confident. Connected. Open to Change.* **2010.**

30. Jahagirdar, Sujatha and Baxandall, Phineas. *Searching for a Better Ride Ohio Students Want to Live in Communities with Transportation Options.* **Columbus, OH : Ohio Public Interest Research Group, 2015.**

31. Vermont Transportation Board. *Getting Millennials from A to B Vermont Transportation Board 2014 Report to the Legislature's House and Senate Transportation Committees.* **Montpelier, VT : Vermont Transportation Board, 2015.**

32. Wickenheiser, Matt. Census: Maine most rural state in 2010 as urban centers grow nationwide. *BDN Maine.* **[Online] March 26, 2012. [Cited: September 6, 2016.] http://bangordailynews.com/2012/03/26/business/census-maine-most-rural-state-in-2010-as-urban-centers-grow-nationwide/.**

33. Speight, Bruce. *Driving Wisconsin's 'Brain Drain'?* **Madison, WI : WISPIRG Foundation, 2014.**

34. *The impact of millennials' travel behavior on future personal vehicle travel.* **Polzin, Steven E, Chu, Xuehao and Godfrey, Jodi. 5, Tampa, FL : s.n., 2014, Vol. Energy Stratagy Reviews.**

35. Dutzik, Tony and Baxandall, Phineas. *A new Direction, Our Changing Relationship with Driving and the Implication for America's Future.* **s.l. : U.S. PIRG Education Fund, Frontier Group, 2013.**

36. *The "Transportation Revolution" - How Do Planners Grapple with an Uncertain Future?* **Gayle, S. Charleston, SC : Tools of the Trade Conference, 2016.**

37. U.S. Department of Transportation, Federal Highway Administration. *Summary of Travel Trends: 2009 National Household Survey.* **2011.**

38. U.S. Census Bureau. *2012 National Population Projections.* **2012.**

39. Shinkle, Douglas, Rall, Jamie and Wheet, Alice. *On the Move: State Strategies for 21st Century Transportation Solutions.* **July 2012.**

40. Pucher, John and Renne, John L. *Rural mobility and mode choice: Evidence from the 2001 National Household Travel Survey.* **2005.**

41. Baxandall, Phineas. *Moving Off the Road: A State-by-State Analysis of the National Decline in Driving.* **s.l. : U.S. PIRG Education Fund, 2013.**

42. The Council of Economic Advisers. *15 Economic Facts about Millennials.* **2014.**

43. Taylor, Paul, et al. *A Balance Sheet at 30 Months: How the Great Recession Has Changed Life in America.* **s.l. : Pew Researchc Center, 2010.**

44. The Nielsen Company. *Millennials-Breaking the Myths.* **2014.**

45. *Survey: To recruit and keep millennials, give them walkable places with good transit and other options.* **Goldberg, David. April 22.**

46. *Millennials Prefer Cities to Suburbs, Subways to Driveways.* **Company, The Nielson. 2014.**

47. *Are the next generation of drivers really only interested if the car is fully networked and connected?* **Row, S. 4, Thinking Highways: The Intelligent choice for ITS, North America Edition, Vol. 9, p. 56.**

48. **Lockbridge.** *Connectivity and the Generational Divide: The Value and Views of Automotive Technology Across Generations.* **2014.**

49. **Pew Research Center.** *U.S. Smartphone Use in 2015.* **s.l. : Pew Research Center, 2015.**

50. **Drake, Karen CK. Zipcar Survey Reveals Millennials Are More Dependent on Mobile Phones Than Cars.** *Zipcar.* **[Online] February 2013. http://www.zipcar.com/press/releases/third-annual-millennial-study.**

51. **Row, Shelley. Are the Next Generation of Drivers Really Only Interested if the Car is Fully Networked and Connected?** *Thinking Highways.* **December 2014, p. 56.**

52. *Role of Social Media in Communicating Transit Disruptions.* **Chan, Raymond and Schofer, Joseph. 2415, 2014, Transportation Research Record: Journal of the Transportation Research Board, pp. 145-151.**

53. **Villwock-Witte, Natalie and Clouser, Karalyn.** *Mobility Mindset of Millennials in Small Urban and Rural Areas: Technical Memorandum, Survey Findings - Demographics.* **Bozeman : Western Transportation Institute at Montana State University, 2016.**

54. **Villwock-Witte, Natalie M. and Clouser, Karalyn.** *Mobility Mindset of Millennials in Small Urban and Rural Areas: Technical Memorandum, Survey Findings - Transportation.* **Bozeman : Western Transportation Institute at Montana State University, 2016.**

55. **Villwock-Witte, Natalie M. and Clouser, Karalyn.** *Mobility Mindset of Millennials in Small Urban and Rural Areas: Technical Memorandum, Survey Findings, Lifestyle.* **Bozeman : Western Transportation Institute at Montana State University, 2016.**

56. **Howden, Lindsay M. Age and Sex Composition: 2010. [Online] May 2011. [Cited: June 30, 2016.] http://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf.**

57. **United States Census Bureau. Quick Facts United States.** *U.S. Census Bureau.* **[Online] [Cited: June 29, 2016.] https://www.census.gov/quickfacts/table/PST045215/00.**

58. **Chokshi, Niraj. So, we're learning a lot of interesting thinigs about who uses Uber.** *Wonkblog.* **[Online] The Washington Post, May 20, 2016. [Cited: September 22, 2016.] https://www.washingtonpost.com/news/wonk/wp/2016/05/20/so-were-learning-a-lot-of-interesting-things-about-who-uses-uber/.**

59. **Resource Systems Group (RSG).** *Who's on Board: 2014 Mobility Attitude Survey.* **s.l. : Transit Center, 2014.**

60. **Global Strategy Group.** *Rockefeller Millennials Survey.* **2014.**

61. *Transportation Preferences, Lifestyle Characteristics of Self-Identified Disabled Survey Respondents.* **Villwock-Witte, Natalie M. Washington D.C. : Submitted to the 2017 Transportation Research Board Annual Meeting, 2016.**

62. Duggan, Maeve. The Demographics of Social Media Use. *Pew Research Center.* **[Online] Pew Research Center, August 19, 2015. [Cited: September 9, 2016.] http://www.pewinternet.org/2015/08/19/the-demographics-of-social-media-users/.**

63. Adventure Cycling Association. Visit Missoula. *Adventure Cycling Association.* **[Online] [Cited: September 9, 2016.] https://www.adventurecycling.org/about-us/visit-missoula/.**

64. Walk Score. About Walk Score. *Walk Score.* **[Online] Walk Score, 2016. [Cited: September 9, 2016.] https://www.walkscore.com/about.shtml.**

65. Washington, Simon P., Karlaftis, Matthew G. and Mannering, Fred L. *Statistical and Econometric Methods for Transportation Data Analysis.* **Boca Raton : Chapman & Hall/CRC, 2003.**