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Examining Disparities in Long-Distance Travel Access

Hannah Catherine Ullman
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EXAMING DISPARITIES IN LONG-DISTANCE TRAVEL ACCESS

A Thesis Presented

by

Hannah Ullman

to

The Faculty of the Graduate College

of

The University of Vermont

In Partial Fulfillment of the Requirements
for the Degree of Master of Science
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Thesis Examination Committee:

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ABSTRACT

This thesis examines several nuanced issues, including equitable access, regarding long-distance intercity travel. In the United States, studies of transportation equity focus on affordable access to local destinations and basic services. The limited studies of long-distance intercity travel focus on observed demand, ignoring latent or unmet demand. Both quantitative and qualitative data are used to explore the differences between those who participate in long-distance travel and those with unmet need for it. This thesis found that the ability to participate in long-distance travel plays a role in one’s overall well-being. Undertaking long-distance trips facilitates access to opportunity for cultural and educational experiences, as well as the maintenance and creation of social capital, factors which were indicated by study participants.

The first part of the thesis examines equity in access to long-distance travel between individuals by using data from a state-wide survey completed by 2,232 Vermonters for the Vermont Agency of Transportation in 2016. Five ordinal logistic regression models that approximate different levels of realized and unmet travel are used to understand how access to intercity travel differs by socioeconomic, geographic location, and household characteristics. A total of 22 percent of respondents indicated they had unmet demand at least once per year. Furthermore, there was a significant correlation between those who had unmet demand within Vermont and outside of Vermont, proxies for local and intercity travel, respectively. Income level, Internet access, and education level were found to be significant predictors of realized long-distance travel. Household size and composition, household vehicles, age, income, and self-reported urban residence were predictors of both unmet local and long-distance travel need. In addition, full-time employment was significant for local unmet need, while miles to the nearest metropolitan area was a significant predictor for longer travel needs. Models of actual travel were stronger than for unmet demand, indicating that other unmeasured predictor variables may be important, thus requiring qualitative exploration.

The second part of the thesis consists of an in-depth examination using semi-structured interviews regarding intercity travel with 24 women living in Chittenden County, Vermont. In addition to the qualitative survey methods, data from a social network geography survey designed specifically for the study and an overall well-being survey were used. Interviews were coded by theme relating to travel type, barriers to travel, and impact on quality of life. A majority of participants felt long-distance travel was very important or essential to their well-being and they wished to increase the amount they did. Additionally, participants felt the need to meet with friends and family in-person, therefore necessitating long-distance travel to those who lived further away. There was also a discrepancy between the desire to meet with friends and family and how often the participants actually were able to do so. Those with higher incomes had less unmet long-distance travel need.
CITATIONS

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INTRODUCTION

Background and Motivation

While long-distance travel may not be as ubiquitous as daily travel, it fulfills a growing need in society to visit friends and family, have new experiences, pursue new employment opportunities, and meet obligations, such as for work. As global connection increases, many people are able to maintain or build upon a social network that can be spatially dispersed. In the age of seemingly constant telecommunication via texting, video calls, email, and more, those who would like to form new ties to others are not necessarily limited by distance, nor are those who need to maintain existing ones. Telecommunication and the abundance of social media can also have the effect of spurring on the desire to travel as onlookers are introduced to new destinations they may not have otherwise heard of or thought of visiting. More transportation options than ever are available to society as a whole, though the benefits of which tend to be disproportionately distributed to those of a higher socioeconomic status. This thesis argues that long-distance travel serves a different purpose than daily travel – one that cannot be replaced by increasing daily travel or the use of telecommunications. This thesis branches out from the traditionally studied daily or local transportation equity to understand population differences in intercity travel.

However, long-distance travel is a complex topic for study because it is not well-defined. There are few existing datasets of long-distance travel and methods for collecting current data on long-distance travel are either burdensome or incomplete and data sources are few. Though a National Household Travel Survey (NHTS) is being
conducted in 2016-2017, the most recent national long-distance data for the United States is from 2001. While collecting survey data is useful for understanding national trends, most analyses do not gather information on unmet, or latent demand. Available national data only speaks to what travel has been acted upon, not what travel people desire, want, or need, and did not undertake for whatever reason. This thesis attempts to do several things; first, it uses survey data on unmet demand in Vermont to help identify the socioeconomic, geographic, and household attributes that define those who have unmet demand. Second, it employs a novel survey method that attempts to demonstrate the geographic extent of one’s social network in order to make a case for why one might need to travel far – or not. Finally, in-depth interviews are used to examine why certain people travel and what prevents them from doing so when they want to. Chapter 2 of this thesis contains a comprehensive literature review covering the following topics: how long-distance travel is related to social capital and overall well-being, the definitions of long-distance travel, a brief history on transportation inequity as it relates to accessibility and mobility, and the different characteristics of disadvantaged groups in transportation. Chapters 3 and 4 are journal articles outlined here in the following subsections. Chapter 5 summarizes the thesis contributions and makes recommendations for future research.

**Article One Outline**

One of the keys to having a holistic understanding of long-distance travel is to study those who do *not* participate in it. While much of the national data speaks to who does participate in long-distance travel, this article looks at those with unmet demand or need. This article poses the following research questions: (1) What is the extent of unmet
demand for long-distance travel, (2) Is unmet long-distance travel need correlated with the unmet need for local travel, and (3) How does long-distance travel need vary with socioeconomic, geographic, and household characteristics? The data used comes from the 2016 Vermont Agency of Transportation Long Range Transportation Planning Survey (LRTPS) survey (n=2,232). A spatially-random sample was collected using paper and online surveys. While the survey gathered data on travel behavior, customer satisfaction, opinions on policy and funding, emerging trends in technology, and sociodemographic variables, it also contained unique questions on the frequency with which one experienced unmet travel demand of different types. The analysis in this article contains five models using ordinal logistic regression to consider which characteristics contribute to one either traveling long-distance or being long-distance travel disadvantaged.

**Article Two Outline**

Besides understanding who is transportation disadvantaged, there is even less known about the factors associated with travel disadvantage. While income is a factor known to affect the extent of one’s long-distance travel, the degree to which lack of intercity travel affects those who cannot participate in long-distance travel is undocumented. In addition, a comprehensive review of the other factors related to unmet demand have not been fully enumerated. This article addresses the following research questions: (1) How does the ability to participate in long-distance travel affect well-being, (2) Is the extent of one’s social network geography related to travel and travel needs, and (3) What are the barriers to accessing long-distance travel? Women were selected for the study because they are
one of the typically underserved people groups, and were a group where it was possible
to reach a large enough participant pool (n=24). This article also surveys the same
women with a unique “geography of your social network survey,” which includes
questions about level of current intercity travel as well as unmet needs and locations of
social contacts. The complexity of our transportation system and the challenges of
measuring access and equity to long-distance destinations dictate the decision to use a
relatively open-ended interview format to gain a better first understanding of this
understudied topic and the factors that affect demand and latent demand for long distance
travel. The results highlight 12 themes related to types of travel, barriers, and well-being.
LITERATURE REVIEW

Introduction

Transportation systems are complex and the United States is a unique case. Unlike many other developed countries with extensive multimodal transportation systems, the United States is substantially roadway and automobile-dominated, thus a substantial portion of the population relies on personal vehicles for both short and long distance travel. As a result, the field of transportation research is one that is expansive, diverse, and interdisciplinary. It encompasses many different subject areas ranging from engineering and design to forecasting, planning, and policy.

In addition to providing access for people to their jobs and daily activities or errands, the transportation system is important in the movement of goods and resources via trucking, rail, and air, as well as enabling people to travel long distance to places beyond one’s hometown or city. This thesis focuses on the long-distance intercity movement of passengers. Between 2010 and 2014, total passenger miles traveled by highway in the United States increased by three percent, continuing to greatly surpass all types of transit and air modes (Bureau of Transportation Statistics, 2016). This is partly due to infrastructure availability and lack of multimodal services, but also to perceptions that automobile transportation can be comfortable, convenient, and often more affordable than alternatives. The predominance of a single mode of transportation helps to explain why there is an inequitable distribution of accessibility and mobility.

Accessibility is the “ability to reach desired goods, services, activities, and destinations” (Litman, 2003), as well as employment, social interaction, and
entertainment opportunities (Páez et al., 2012). Mobility, on the other hand, can be defined as the speed and ease of traverse across space that an individual experiences through various different modes of transportation which are used to arrive at a desired destination (Litman, 2003). The National Research Council (2002) delineates that levels of mobility are “higher when average travel times, variations in travel times, and travel costs are low.” It also indicates that transportation system mobility can be measured with indicators such as having a “reasonable” travel time, low amounts of wasted time, reliability, being on schedule, the physical condition of modes, and user costs. Some researchers have broken mobility down into further categories: “physical travel” for different trip purposes, “virtual travel” through online media, and “communicative travel” using things such as texting, email, paper mail, and phone calls (Larsen et al., 2006). As there are different categories of mobility, it is possible that there is less emphasis on the study of physical long-distance travel because it is even more complex than daily travel—a barrier that has led to very limited data for use in studies. In this thesis, these definitions are used to distinguish between the two concepts which are often muddled together. In short, accessibility is the access to opportunities and mobility is the act of traveling.

Transportation equity can be thought of as providing “access to opportunity [which] . . . serves as a key component in addressing poverty, unemployment, and equal opportunity goals” (Bullard, 2003). Another source defines equity as “the fairness with which impacts (benefits and costs) are distributed (Litman, 2002). Transportation equity, and existing studies which have been predominantly focused on local access to daily
needs such as employment, school, or services, will be discussed in more detail in the following sections. However, this thesis focuses on how the benefits of long-distance intercity travel are distributed among the various socioeconomic groups. As Bullard (2003) explains, “transportation remains a civil rights issue,” the position through which long-distance travel equity will be studied in this thesis.

In addition to the expansive size of the United States, automobile dependence also stems from the fact that most rural areas in the country have limited to no access to public or mass transit options. The population density to support viable widespread transit systems does not exist in rural areas including Vermont, the study area for this thesis. Furthermore, land use patterns that lead to urban sprawl increases reliance on personal vehicles. Key distinctions of sprawl include: low-density development, designated land uses that often place residential areas far from commercial ones, and “consumption of land . . . at a faster rate than population growth (Lewyn, 2002).” These characteristics of sprawl make personal vehicles the only reliable transportation choice in lower-density areas. The particular land use patterns in the United States, further magnifies equity gaps in transportation accessibility and mobility. Research on job access and reverse commutes has included the challenge of providing transportation to employment in suburban areas for underserved communities that often live in urban cores (Cervero, 2004).

In transportation planning, decisions must be made that impact the accessibility and mobility of many different population groups who all use the same transportation systems. In many cases, travel demand modeling is used to understand what
transportation options people use, where they will travel, how often they travel, and the routes they take. The travel demand model has four general components: trip generation, or the total number of trips made by households in a given area; trip distribution, or the destinations of these trips; mode choice, characterized by the attributes of the trip maker, the journey, and transport facilities; and trip assignment, the predictive process for determining a trip’s route (Ortúzar & Willumsen, 2001). Similar frameworks have only recently been applied to nationwide long-distance travel contexts (Outwater et al., 2015; Schiffer, 2012; U.S.DOT, 2013). However, within this model framework only revealed demand, that which has occurred or is acted upon, can be taken into account for planning and policy purposes. Existing household travel surveys such as the National Household Travel Survey (NHTS), which often include a 24-hour travel diary, collect data on travel that has occurred. This leaves out latent demand entirely, i.e. demand for something that is desired but which cannot be fulfilled. Lack of data or information on latent demand limits analysis and policy in that only the existing observed travel demand is accounted for in models and other metrics and statistics. As such this approach only works for some of the population, i.e. those currently traveling in preferred ways in response to their desire to satisfy their daily and annual needs, including intercity needs.

While there has been extensive study on local daily travel in one’s home region, long-distance and intercity travel has not been focused on, in part due to a lack of data but also because some deem it as non-essential compared to access to daily subsistence needs such as work, school, or food. This thesis argues that long-distance travel is an
understudied part of one’s travel profile and is important in its provision of access to social capital and well-being.

Figure 1 provides the theoretical framework of long-distance travel equity used in this thesis. There are five groups of factors that contribute to a certain level of access to long-distance travel, including personal attributes, household attributes, home location, worker type, and lifestyle. Personal attributes are measures that are unique to an individual and may have an impact on their travel habits. For example, being a woman makes an individual more likely to take on the bulk of child rearing responsibilities, thus perhaps resulting in more local demands or less time for intercity travel. Household attributes are factors describing the whole household, such as household income or the number of cars a household possesses, therefore playing a role in the availability of different modes of transportation. The household make-up has also been shown to impact travel behavior. Home location is another important factor that has to do with whether essential destinations are within a reasonable distance, and if not, whether appropriate transportation options are available to individuals. Worker type can also affect travel as employment status can dictate how much someone travels, especially if their profession requires business travel; the 1995 ATS and NPTS both showed that work related travel was one of the highest trips purposes, nationally making up 24.4 and 20.2 percent of travel, respectively (Bricka, 2001). Finally, lifestyle encompasses the less quantifiable aspects of whether or not one chooses to travel. This includes several personality traits like personal preferences for travel, life experiences that make one more or less prone to desiring travel, and travel savviness, which speaks to one’s ability to use
available resources and knowledge to plan a trip. Lifestyle also includes imagination, or the ability to picture how one might travel, even if they do not.

With the culmination of these factors for a given person in a particular location with a desired destination in another city or town, one will either decide if they can or want to act out their potential travel need, leading to mobility or unmet travel demand, respectively. Undertaking a trip or mobility has the potential to lead to two types of direct benefits: either the creation or maintenance of one’s social network, or the prospect of opportunities, culture, and various services. While these two direct outcomes can be achieved in part by means of telecommunications (Figure 1), others have argued that in-person interactions with eye contact and touch that results from actual long-distance travel is necessary (Urry, 2003) and leads to increases of social capital as a necessary to achieve a certain level of well-being, as opposed to when travel demand goes unfulfilled. Moreover, many opportunities and services require in-place or in-moment interaction and thus require travel (Larsen et al., 2007). Note as well, that in addition to partially replacing in-person interactions, telecommunications can have the effect of spurring on the desire to do long-distance travel by enabling individuals to plan trips at a lower cost or more efficiently, by providing inspiration to take trips, and by helping to maintain connections with distant people they might otherwise not have.
Figure 1. Theoretical framework for the equity of long-distance travel
As one scholar phrased it, those that “do better” in life are “better connected” (Burt, 2001). This thesis hypothesizes that when underprivileged groups have limited access to long-distance travel, their ability to maintain and build new ties in their social network is restricted, thus limiting overall social capital and creating inequity. The two journal articles (Chapter 3 and 4) seek to understand how unmet demand for long-distance travel differs between socioeconomic groups, and the extent to which it affects one’s well-being. This literature review chapter contains eight sub-sections. Following the introduction, section 2.2 discusses how long-distance travel and social capital are interrelated, and why long-distance travel may be required to maintain and build social networks. Section 2.3 explains how well-being, in part stemming from available social capital, provides a cause for participating in long-distance travel. Section 2.4 covers the concept of derived demand for long-distance travel, a concept that suggests long-distance travel is a necessity for many. Section 2.5 gives an overview on some of the national trends in long-distance travel known in the United States, along with listing some of the factors that affect the trends. Section 2.6 follows with a discussion on the different traditionally underserved people groups in transportation along with a brief overview of the history of transportation inequities. Section 2.7 describes the differing long-distance travel definitions and section 2.8 discusses the definition of equity in relation to accessibility and mobility. The second half of section 2.8 concludes by explaining the research gaps in long-distance travel and provides a summary of the remaining thesis chapters.
**Long-Distance Travel and Social Capital**

While long-distance travel has been studied to some extent, there has not been a targeted focus addressing the practical importance of equity in *opportunities* to do long-distance travel and how it relates to one’s social network and social capital. Here social networks may be defined as “structures whose nodes represent people or other entities embedded in a social context, and whose edges [or links] represent interaction, collaboration, or influence between the entities” (Liben-Nowell & Kleinberg, 2007). As such, social capital and social networks are concepts that are interrelated. The definition may be further extended to include the understanding that social capitals *are* the embedded resources within a social network, and may include things such as physical resources, emotional comfort, and anything that may further an individual’s personal endeavors or support them in some way (Lin, 1999). Social capital assets are *found* in social networks; this includes the access to resources which can be utilized through purposeful actions. When one builds social capital, they are investing in their social networks with the expectation that they will reap returns, whether in the form of physical resources, or other types (Lin, 1999).

In Lin’s (1999) social capital theory there are two types of actions that can be enacted within a network. One may use instrumental actions to obtain resources that are not already held by the actor, or one can use expressive actions to maintain resources already possessed. Here we might make the connection to long-distance travel by saying that long-distance travel may involve both expressive actions to maintain connections
with friends, relatives, and otherwise important people, and instrumental actions to form new connections.

Within a social network there are ties that connect individuals — these networks of connections can be very complex. Furthermore, not all ties are equal because they can be strong or weak in strength. Some ties may be more “valuable” than others when they include strategic connections in the social network or when a tie’s societal position is higher than one’s own (Lin, 1999). Thus, some studies argue that having more weak ties may lead to more or better resources. Network ties may not always be geographically proximate to an individual, therefore prompting the need for telecommunication or long-distance travel.

Within the field of social network analysis, there are many areas of study, some of which are “the impact of urbanization on individual well-being, social support, community, and occupational mobility” (Wasserman & Faust, 1994). Nonetheless, geography and social network subjects are sparsely talked about in the same academic paper. One study notes this and attempts to create models of social networks with the assumption that geography plays a role in the ties that individuals form (Daraganova et al., 2012). The paper reported that while shorter distances between actors tended to make forming a tie more likely, “at larger distances spatial and network processes operate slightly differently;” conclusions about the relationship between geography and the formation of ties became harder to predict using the models although the maximum distance between respondents in the study was about 185 miles. The idea of physical proximity making the creation of ties more probable comes from Festinger et al. (1950);
however, this is a theory which was developed long before today’s globally connected society. The theory may appear to hold fast today if only for the reason that reliable models which predict the geographic spread of social networks at a distance are difficult to develop.

We might hypothesize that a lack of access to long-distance travel that limits interregional mobility leaves some people at a disadvantage because they cannot maintain capital and they do not have as many opportunities to connect with those who are more advantaged than them. For example, those who have unmet travel demand were less likely to overcome mobility challenges due to being part of a social network where many others were also transportation disadvantaged (Kolodinsky et al., 2013). The tendency to associate with others of a similar socioeconomic status resulted in homogeneous ties which tended to be in a lower position in society (Lin, 2000). In Lin’s 2000 study, women were found to have a greater diversity of family ties than men, as well as more ties in number. However, their ties tended to be found lower in the social hierarchy. If long-distance travel needs go unfulfilled for certain underserved groups, it may disproportionately impact those who already are of lower socioeconomic status.

The inequity in social capital stems from two reasons: the first is that individuals tend to have the majority of their ties within one socioeconomic level, and the second is that individuals most often create new associations with others that also have the same socioeconomic status, a phenomenon called homophily (Lin, 2001). Thus, the potential problem in limited access to long-distance travel is that some underserved groups may have less in-person contact with their ties and fewer chances to use those contacts to
bridge to new ones even if they have adequate access to local destinations within their home community. This literature review argues that individuals require face-to-face interaction for the purpose of building and maintaining strong social networks, which is a necessary part of overall and continued well-being. In fact, those with more spatially spread social networks may have lower “network capital” and a higher risk of social exclusion (Cass et al., 2005). The linkage between social capital and equity culminates with Lin’s “Social Resources Theory” (1999), which says that there is an interconnection between embedded resources in a network and the socioeconomic status that one secures. Lin asserts that the “convergence of social resources and social capital theories” has created a link to social networks where there is utility gained from being able to “mobilize” the resources; access to resources is examined as an integral part of that.

Telecommunications have become integral to the global society and interactions with those at distance. If communication by technological means were adequate to maintain social network tie strength, then having a more geographically spread network of ties should not affect one’s risk for social exclusion. However, Urry (2002) points out that not only is travel a fundamental human right, but that increasing local mobility or use of technology for communication cannot substitute the act of long-distance travel. In his study he argues that “corporeal” travel can never effectively be replaced because of the human desire for physical proximity to others, places, and events, in addition to having unavoidable travel obligations such as for legal, social, economic, live, and place-based reasons — or things that are dictated by location. Thus far there has not been a study on the importance of long-distance travel and how it relates to social capital. Not being able
to travel to far away social ties may lead to lower overall well-being, and this may disproportionately affect different populations in the U.S.

**Long-Distance Travel and Well-Being**

In the past hundred years, the standard for human interaction has changed significantly. The idea of locally based social circles stems from the early 1900’s in Europe and North America when face-to-face interaction was a staple of daily social life that was most often contained within a relatively small geographic area; since then there has been an increase in the *spread* of social networks (Larsen et al., 2006). While not all individuals may think of long-distance travel as a necessity for well-being, it certainly plays a role in how individuals maintain relationships with those they consider close, and how individuals choose to spend their limited time. In a study conducted in the San Francisco Bay Area on long-distance travel, 63 percent of people said that they were positive about long-distance travel, an affinity for which was higher than short distance travel (Mokhtarian & Salomon, 2001). This may suggest that the destinations or purposes behind longer-distance trips were more special or satisfying than ones that are shorter. It was also found that respondents preferred travel related to “recreation, entertainment, and social activities,” as opposed to for business purposes. Travel by air was also preferred over vehicle travel. Finally, some respondents reported to like travel for the sake of traveling. When asked how much more one would like to travel, about 55 percent said that they wanted more travel, 35 percent wanted their travel to stay the same, and about 10 percent wanted less travel. While the study was looking to study travel for travel’s sake, the authors admit that it is likely that there is still some association with the
destination of a trip when the questions were answered. Thus, when respondents reported that they wanted more travel, we might reasonably infer that some of them likely meant that they would prefer more trips, vacations, visits with friends and family, and the like.

The ability to undertake long-distance travel for the purpose of maintaining and building social networks from which one may access resources is wedded to the idea of well-being. While there is no definitive meaning for well-being, it is measured from the perspective of the individual, and is loosely defined by “judging life positively and feeling good” (Veenhoven, 2008). As a field, subjective well-being considers more than just financial success, it focuses on three interconnected areas: “people’s emotional responses, domain satisfactions, and global judgments of life satisfaction” (Diener et al., 1999). Global satisfaction can be further broken down into categories which include areas such as “recreation, love, marriage, [and] friendship” (Diener et al., 1997). Thus, subjective well-being is not defined by any outside criteria, but rather varies by the individual’s own evaluation of their life satisfaction.

Veenhoven (2008) equates Jeremy Bentham’s definition of happiness to subjective well-being in that it is “the balance of pleasure over pain” (Burns, 2005). Another study uses a quality of life definition that is similarly related to well-being, but is divided into objective and subjective categories, where the former are the “facilities and chances in one’s life” and the latter are the “sense of being advantaged so that the consequence is a sense of happiness” (Noghani et al., 2009). In the study of transportation equity, it may be important to study both the objective and subjective aspects of well-being for the sake of determining whether or not transportation policy
goals accomplish what they set out to do as perceived by those they were intended to serve. For subjective well-being, it is up to the individual to evaluate if the presence or absence of long-distance travel accessibility in their life contributes to further opportunities that are a part of their happiness equation. Part of the second thesis article (Chapter 4) uses interview-based data to explore how women decide to make interregional trips and how their life is affected by making or not making these long-distance or intercity trips. The in-depth interviews, which look at the subjective side of how a participant views their own travel, are accompanied by objective survey measures (Appendix A) of long distance travel which were designed with a team during this thesis work but are analyzed elsewhere.

The concept of social exclusion can also be connected to subjective well-being since those who are excluded may feel lower levels of happiness. Here we define social exclusion as a social disadvantage where uneven access to a means to do long-distance travel contributes to fewer chances to build or maintain social networks, a condition which may lead some individuals to rate their well-being as being lower than they would like. One study, while not necessarily examining long-distance travel, found that those at risk of social exclusion made fewer and shorter distance trips (Stanley et al., 2010). Thus, social exclusion is not a result of “lack of social opportunities but a lack of access to these opportunities” (Preston & Rajé, 2007).

In another study, those who were found to be at risk of social exclusion exhibited traits such as not feeling a strong sense of community, had lower incomes, and less mobility (Stanley et al., 2010). Those at risk also lacked regular contact with significant
others and had less contact with immediate and extended family members. At this point, we do not know whether those who felt socially excluded would require face-to-face, communicative contact, or a combination of the two to remedy their situation. While the concept of social exclusion will not be explicitly studied in this thesis, it remains one of the drivers behind the continued need for better data sources concerning unmet need for long-distance travel.

Concerning physical location, one study found that some relationships did not survive when key contacts moved; additionally, the study claims that certain pre-existing resources may be required to build social capital (Cattell, 2001). A supporting study argues that “social capital is not transferable,” (Coleman, 1990), which may be one reason why some in lower socio-economic status’ may have their social capital suffer when they are constrained by income and the high cost of most long-distance travel. Even more so, they have less ability to relocate themselves nearer to friends and relatives as there is sometimes reduced flexibility in housing, employment, and transportation options available to them. Furthermore, social capital was found to be related to well-being, specifically with coping ability, enjoyment of life, and feelings of hope — in other words, the belief that one controls their destiny, and that future events or other aspects of well-being are not predetermined (Cattell, 2001). Thus, it seems that one factor in well-being is an individual’s outlook on whether they personally possess the ability for success (by their definition) and grasp the opportunities that they desire. Still, one who is not extremely hopeful to begin with may be further discouraged when transportation options
are difficult to utilize or very limited to that individual. The complexity of this topic necessitates use of both quantitative (Chapter 3) and qualitative methods (Chapter 4).

Prior research has suggested that opportunities for long-distance travel may be related to the formation and maintenance of social networks. One study found that participants lived an averaged distance of 500 kilometers away from people they classified as their “most important people” (Larsen et al., 2006). The authors note that this distance was not based on actual transportation networks so the distance to travel to them may actually be longer. Additionally, they met at the same frequency with those that lived 125 kilometers away as those living 400 kilometers away. Participants reported that they met with their “strong ties” (i.e. their “most important people”) at least once per year. Two factors found to be positive indicators of well-functioning social networks were the extent of social participation and communication (Karimzadeh et al., 2013); the former which we may argue requires some degree of long-distance travel in order to interact at events that are place-based. However, fulfilling obligations that require travel can be expensive and, in turn, exclude those without the financial means to participate or limit budget available for other needs.

Studies of obligatory social events demonstrate a connection to our automobile dominated transportation system in the United States. In a study where participants were interviewed about their long-distance travel habits, many provided examples of instances where they deemed travel as necessary, such as weddings and stag nights, and as a result, having a car was essential for making trips that only lasted two to three days (Larsen et al., 2007). Participants mentioned that having access to a car was the only way that made
it possible for them to attend these obligatory events. Having a car gave them flexibility so that they did not have to miss work for an event, and it was often more economical than air travel. Additionally, leisure travel (which may include visiting friends and family) was found to be much less income elastic than other trip purposes (Dargay & Clark, 2012), so while income increases, so does travel demand — however, for leisure travel in particular, people require this type of travel more than other types of travel, regardless of income level.

Although long-distance travel may be part of what is needed for overall well-being, it has been studied little in recent years and even less so in terms of equity. Thus far, it is unknown how much not participating in long-distance travel effects one’s well-being, especially if one must forgo visiting with friends and family. The circumstances and reasons responsible for underserved travel demand is one area that Chapter 4 will attempt to fully enumerate. However, before this can be explained it is important to understand that long-distance travel may also be considered a derived demand, just as most local travel is.

**Derived Demand for Long-Distance Travel**

The concept that travel is a derived demand means that we travel as a means to participate in activities located at destinations, or different locations across space. Others alternatively argue that travel *is* the activity — that travel is undertaken for the sake of traveling (Mokhtarian & Salomon, 2001). Examples of this include driving scenic roads for the view, and walking and biking for exercise. Mokhtarian and Salomon (2001) argue that longer routes are taken sometimes because of the “variety-seeking” nature of
humans. They continue by saying that part of the utility derived from travel may have to do with the other activities one can do while participating in travel, such as reading while riding on a train. The authors argue that humans have some degree of intrinsic desire to travel. Whether humans desire travel as an activity or as a means to go somewhere, this does not change how the nation as a whole understands the demand behind long-distance travel. If travel is a derived demand, from a Neoclassical economic standpoint, one might say that low-income people demand less leisure travel because they do less travel, although the amount of travel might not be their choice. As leisure trips tend to become more expensive based on increased overnight stays and international and commercial air travel (LaMondia et al., 2014), this may be cutting down on social interaction gained since this type of travel is often paired with visiting friends and relatives.

Disadvantages in transportation access and social exclusion may be linked as a mismatch between available and affordable public or mass transportation and actual social needs (Currie et al., 2009). Demand for new types of transportation or extended services may not be apparent to policy makers and planners because the “customers” have been forced to adapt to their circumstances and current transportation data sources measures revealed or acted demand. For example, in rural northern New England, unmet travel need was found to be fairly uncommon because people living in this environment viewed car-ownership as a necessity (Kolodinsky et al., 2013). Forced-car-ownership (FCO) may also give the appearance that transportation needs are being met, while this high dependence on automobiles takes a toll on households as they are forced to spend about 50 percent of their household income on car-ownership (Currie et al., 2009). Due
to the high percentage of household income spend on transportation, this may cause other
types of trips or methods of transportation to become prohibitive to them and thus the
activities at the destinations including those important for social network maintenance are
missed.

Since travel is predominantly a derived demand, we should expect that the
reasons for someone to pursue long-distance travel are similar at all socioeconomic
levels. One difference may lie in the amount or type of long-distance travel that the
different groups do, however, more information on unmet needs are required to
understand why we do not see demand across the board for this type of travel. Another
difference might lie in the geography or physical extent of one’s social network that may
vary by socioeconomic group or by travel level. For this reason it is important in this
thesis to measure actual revealed or performed travel, unmet travel need or demand, and
the locations of one’s social network ties.

Existing National Data

The collection of new sources of data are important because despite limited
existing data sources on long distance travel, interest at the state and federal levels has
been increasing in recent years, especially regarding air travel, high-speed rail, and
improvement of highway infrastructure (Federal Highway Administration). Two of the
most studied national comprehensive data collection efforts on long-distance travel are
the 1995 American Travel Survey (ATS) (n=80,000) and the Nationwide Personal
Transportation Survey (NPTS) (n=42,033). The two data sources were combined to form
the National Household Travel Survey (NHTS) in 2001 and the last NHTS was
conducted in 2009, although the 2001 and 2009 versions primarily include data on daily trips taken within a 24-hour period and a section in 2001 used participant recall for trips greater than 50 miles over a 4-week period. The 2016 NHTS is currently being undertaken but only limited long-distance data is being collected (Westat, 2016). Six states which participated in the “add-on” program for additional samples within their jurisdiction elected to ask participants about long-distance travel in their limited number of extra questions. In Arizona, California, Iowa, North Carolina, and Maryland, participants were asked for the number of non-commuting trips greater than 50 miles one-way in the last two months (Westat, 2016). In Texas, the same question was asked with a threshold of 75 miles one-way. Few details about these trips were queried due to space limitations but in Arizona and California some purpose information such as business or personal were collected, as well as mode and most frequent city and state destination for Arizona residents. Though many surveys have attempted to ask participants to recall behaviors, this type of data collection can be inaccurate because it is especially difficult when the time period in question is large and includes estimating distances.

Based on the 1995 ATS, respondents averaged four domestic and international long-distance trips per year (Mallett, 1999). Visiting friends and relatives was the most common trip purpose (33 percent), followed by leisure and business (29 and 22 percent, respectively). The most common modes for long-distance trips were personal vehicle and air travel. A comparison of the 1995 ATS and the 1995 NPTS shows that the
national averages for long-distance trip length were 515 miles for the ATS and 510 for the NPTS (Bricka, 2001), although this study controlled for trips of 100 miles or more.

In 1995, air travel accounted for 18 percent of long-distance trips (Mallett, 1999). In 2009 it was predicted that commercial air travel would increase at a rate of four to five percent each year (Belobaba et al., 2009), but from 2010 to 2014 commercial air passenger miles increased by seven and a half percent — with domestic at 7.6 percent and international at 7.2. From January 2003 to December 2015, total passenger enplanements have risen by 25 percent; international enplanements increased by a greater percentage than domestic at 57 and 21 percent, respectively (Bureau of Transportation Statistics, 2016). Other modes commonly used for long-distance travel have also increased, with personal vehicle miles traveled growing from 230 to 450 billion miles from 1977 to 1995 (Mallett, 1999), and intercity bus use increasing by 22 percent from 2010 to 2015 (Bureau of Transportation Statistics, 2016).

Existing national long-distance travel trends have also been found to vary by many other factors which are often interconnected. For example, employment status mattered in the frequency of long-distance trips made: in the 1995 ATS 66 percent of those who took long-distance trips were employed and similarly the NPTS found 63 percent (Bricka, 2001). In terms of work travel, men were both more likely to be employed and more likely to travel for work (Jeong et al., 2013). The same study found that there was a desire by families and married couples to spend adequate time together, thereby reducing the frequency of travel. Furthermore, women were reluctant to travel due to family care responsibilities. A separate study made the conclusion that family
characteristics do not have a significant effect on the amount of travel men and women do, citing that it is false that “women are not traveling to the extent of men because they are married, have children, or both” (Presser & Hermsen, 1996). The study attempted to control for many of the gendered factors, such as job discrimination against women, which may have an effect on work travel frequency. Interestingly, households with two to four people tended to do long-distance travel most frequently and belonged to the middle-class (Bricka, 2001). This finding was consistent with both the 1995 ATS and the 1995 NPTS, thus concrete conclusions on the effect of household structure on long-distance travel may be more nuanced than some studies have demonstrated as gender, work status, household make-up, and other factors cannot be examined independently.

Long-distance travel also differs from daily travel in how it is undertaken. One study noted that “departure time choice for long trips was strongly affected by how long the trip would be, how much time would be spent at the destination, whether traveling on a weekday or weekend, whether traveling alone or with other companions, and whether traveling with young children” (Jin & Horowitz, 2008). In addition, location may have an effect on how often one travels. The 1995 ATS found that those who lived in more rural areas took more long-distance trips than those in larger metropolitan areas (Mallett, 1999), likely because of the further distance to essential routine destinations. Factors such as socioeconomic status were found to be a determinant in mode choice as well for medium- and long-distance trips, along with household composition, in the United Kingdom and the Netherlands (Limtanakool et al., 2006). While several factors across

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many studies have made conclusions about the things that affect one’s long-distance travel, the factors that cause someone to not travel have not been studied.

Given the dated nature of the national data that is available, its currency is an issue as much has changed in terms of the geographic spread of social networks, potentially putting a new emphasis on the need to do long-distance travel. All of the studies discussed used data that includes only realized travel, but does not delve into what respondents would have liked to do. It is unclear within national data if growth in travel is spread across all population groups or concentrated in some groups because the growth is based on total traffic counts on highways and airplanes – not individual based. While national trends are of some importance for planning, they tend to obscure the finer details of who is traveling by what mode. Overall, better data collection methods should be developed to more comprehensively address underserved groups and to help our transportation system adapt to what may be a new era of increasing long-distance travel.

**Underserved Groups in Transportation**

Certain population groups are often missed or masked in national trends which are often reported in terms of total volumes or average travel times. Often those that are disadvantaged in terms of access and mobility include women, children, and the elderly, minorities, refugees or immigrants, disabled persons, and the poor. Undertaking long-distance travel becomes more difficult when many of these groups have the underlying disadvantage of lower income, although income can be a standalone factor. The 1995 ATS showed that two-thirds of low-income households surveyed did not make one long-distance trip during that year. When they did make a trip, they tended to stay longer at
their destination (Mallett, 2001), likely to maximize the utility of their trip due to high travel costs or because they had combined two or more trip purposes.

According to the United States Bureau of Transportation Statistics, in 2016, 65 percent of households with no registered vehicle had a household income of less than $25,000. This is certainly a barrier to long-distance travel for some low-income households who are not able to afford air travel. In the 1995 ATS, it was found that those with very high income make three times as many long-distance trips as those with very low income (Georggi & Pendyala, 2000). Furthermore, while race does not necessarily imply certain long-distance travel habits, it is connected with income. In a comparison of long-distance trips between Massachusetts, New York, and Oklahoma, white, non-Hispanic people were by-far the group with the highest percentage of long-distance travelers at 83.5 percent or higher for each state (Bricka, 2001).

Women are another underserved group that not only face lower incomes, but also have additional challenges related to historical gender roles. In Mallett’s research (1999) it was found that women make up 45 percent of all long-distance trips and miles, although the average trip distance was the same for men and women. The same study showed that men travel more than twice as much as women for business travel and that a larger percentage of women than men travel for seeing friends and relatives. The types of jobs commonly held by women do not require as much business travel, though, as the percentage of women traveling for business has increased, their long-distance travel for other purposes has decreased. In general, women have been shown to travel less than men as a result of having lower income, more household responsibilities, child-rearing
duties, and less access to personal vehicles (Mallett, 1999). Accessibility for women may also often be determined in part by other factors such as lack of a driver’s license and being a single parent (Páez et al., 2012). Each of these factors are complex and may not be completely understood using survey methods, hence why this thesis uses in-depth interviews to gather the full picture.

Disadvantaged groups still prefer certain transportation modes that majority groups do which involve preferences in comfort, status, or safety. One study of the islands of Timor Leste found that the transit options and poor road conditions on the islands led women to prefer personal vehicles over public transportation (Babinard et al., 2014). In addition, many people who are low-income and living in unsafe areas may choose to not utilize public transportation when it involves having to wait at a bus stop in a dangerous area or wait in an area without adequate bus shelter facilities (Levin et al., 2014). Refugee and New American populations face additional barriers beside income as they often experience difficulties due to language barriers in obtaining a driver’s license, such as not being permitted to use an interpreter for tests not in their native language, lack of affordable driver training, and not being able to get car insurance (Carlson et al., n.d.; Bose, 2011).

Finally, those with physical disabilities face additional challenges. Disability is often viewed as a “social burden which is a private, not public, responsibility” (Imrie, 2000), a sentiment that still remains to some degree in America. In an attempt to mitigate transportation inequities of disabled persons, the American with Disabilities Act (ADA) of 1990 was passed with Title II and specifies that public transportation services such as
public bus transit and rail must not discriminate against people with disabilities. ADA commits transportation service agencies to buying or leasing new facilities that accommodate people with disabilities, and provide paratransit services as long as undue financial hardship can be avoided. Practically, many transit services do not meet the full needs of their disabled users, either because of eligibility requirements for users, limited availability of services, and time cost. Thus, those with physical disabilities face many of the same barriers as other underserved groups, but still must use facilities which physically do not meet their needs (Hine & Mitchell, 2001). Some cases of transportation disadvantage are structural; even with alternative procedures in place, certain modes may still be extremely cost prohibitive to those with disabilities (Imrie, 2000).

Each of the population groups discussed in this section have complex factors which affect their ability to do local and long-distance travel. Often they may be transportation disadvantaged for several reasons, as well as being disadvantaged in other ways in their lives. If transportation planners and policy makers indeed aim to create benefits fairly for all people groups, it is necessary to have a comprehensive understanding of the mobility-related challenges that these groups face. The overall inequalities found in access and mobility within the national transportation system have formed in part from specific policy decisions within the United States, and they have remained unresolved in part due to the lack of proper research and data. Some of the racial inequities in transportation are remnants that originated from systematic racism instituted by the United States government many years ago. The separation of races was strengthened by the *Plessy v. Ferguson* ruling that legalized “separate but equal,”
sustaining unfair transportation practices until 1953 (Bullard, 2004). Unsurprisingly, Bullard notes that the subsequent ruling of *Brown v. Board of Education of Topeka* did not create the overnight changes necessary for the elimination of segregation because many of the causes are still routed in settlement patterns, and educational and employment opportunities. These spatial factors are ultimately integral to transportation services.

In 1994, President Bill Clinton issued an executive order titled, “Federal actions to address environmental justice in minority populations and low-income populations,” which included provisions specifically related to transportation inequities. Scholars have noted that the order does not provide instruction for how transportation inequities of the past, present, and future might be mitigated (Karner & Niemeier, 2013). Others have argued that compliance with the mandate is sporadic, methodology for data collection and analysis greatly varies among municipalities, and in some places compliance is nonexistent. Because inequities in accessibility are poorly measured or not recorded at all, targeting and rectifying them in a practical way is challenging.

Overall, transportation policy and planning often focuses on the more easily quantifiable aspects of transportation and realized demand, succumbing to frequent cost-benefit analyses in an attempt to “monetize” benefits (Delbose, 2012), an over-simplistic method that is blind to historic inequities, as well as spatial and socioeconomic differences. The tallying of benefits may be demonstrated in ways such as comparing ridership without considering if those who need the service most are receiving it, or by investing in reducing travel time at the expense of those who could benefit from having
any service at all. Additionally, analysis of average costs and travel times can overgeneralize and smooth out variation, causing trends at either end of the full distribution to be neglected. When this is undertaken continually, analysis on the needs of the underserved becomes obscured because those on the lower end of the spectrum start to drop out of the sample and become fewer in number as changes are affected. One of objectives of this thesis is to gather data from one group of underserved individuals in order to understand specific personal circumstances that relate to long distance travel but are underreported or masked in national data.

**Differing Definitions of Long-Distance Travel**

While data at the national level can be useful for examining trends, it can sometimes add to the challenge of studying long-distance travel equity because there are often differing definitions that are used by various surveys and research institutions. It can also be difficult to communicate a definition to those outside of the academic sphere because of differences in public perception of what constitutes a long-distance trip. In order to study the differences in long-distance travel equity, it is important to first understand its variable definitions. There is no established definition that is universally accepted. Some scholarly articles use a simple distance threshold most commonly 50-miles which may stem from its use in the 1995 ATS, however, that often inadequately captures all of the nuance and complexity associated with long-distance trips and disregards the present reality of long work commutes which are routine and daily. Additionally, using a simple distance parameter can create confusion when deciding what the distance threshold should be; furthermore, it is difficult for a person to estimate or
recall the distances of trips they take. Moreover, high quality access to relatively fast mobility makes 50-miles less far than for more mobility challenged individuals.

Long-distance trips are also often defined by trip purpose: business, leisure, or personal, though many trip types do not fit neatly into these categories. One data source that uses trip purpose classifications is the Nationwide Personal Transportation Survey, which breaks down trips into 11 categories including: to or from work, work-related business, shopping, doctor/dentist, other family or personal business, school/church, vacation, visiting friends and relatives, pleasure driving, other social or recreational reasons, and other. Further classification can focus on where the destinations are relative to home location, whether they are overnight, the mode that is used, and whether they are recurring trips (LaMondia et al., 2013). While there are differing views on what constitutes long-distance travel, it is necessary to gather comprehensive current data on the trends in the United States. Additional clarification of a long-distance trip includes the definition of overnight travel which comes from Aultman-Hall et al. (2015): “a trip where you leave town AND spend the night somewhere other than home.” This thesis refers to long-distance or intercity travel as overnight or “out-of-town” travel, since most people understand that these are not trips which are made on a daily basis and it implies traveling from a home base to another city, region, or country. The next section describes the different people groups that are traditionally underserved in transportation.
Pursuing Robust Methods to Research Long-Distance Travel Equity, Accessibility, and Mobility

There are numerous detailed facets to understanding the complex differences in transportation accessibility, mobility, and the resulting equity between individuals — with some issues having been probed by researchers more than others. The degree to which a certain topic has been studied results from several factors: the available data, the importance of the subject area, the policy interests of planning agencies and individual researchers, the availability of funding from public or private agencies, and the complexity of the particular topic area. To this end, there have been a relatively large number of studies on transportation equity as it pertains to travel within the local home region as related to one’s home and work locations. This may be because many studies seek to provide useful findings and measurement methods on policy and planning initiatives and improvements intended to continually strive for greater equity overall. The focus is on access to daily necessities, such as places of employment and shopping destinations, which vary depending on the scope of one’s home region. Although intercity travel is less frequent, it seems to garner less attention by researchers because it can be viewed as less of a necessity for those of a lower socioeconomic status and is more difficult to research due to a lack of current and adequate data.

Much of long-distance travel research has focused on networks that are individualized and not interdependent on other obligations or relationships from which travel is derived (Larsen et al., 2006). Researchers fixate on how individuals make travel decisions while ignoring other external inputs in the process. This could include
scenarios where others decide an individual’s travel plans for them, or where external events, such as an unexpected funeral, spur on the individual to make a trip, not out of desire but necessity. Larsen et al. (2006) explain that mobilities are defined by “relational” forces including “caring, guilt, responsibility, and negotiation,” along with some degree of individual decision-making. These are some of the reasons that people feel they must do physical travel, though in-depth interviews in the second article will expand upon this much more. Thus, some of these relational forces drive the need for physical travel, although the extent to which is not known, and even less is known about how much of this obligatory travel is long-distance.

Furthermore, many studies inevitably have elements of researchers’ bias in assuming how underserved people think and behave. The study of accessibility can be divided into two camps, focusing either on the normative, “what should be,” or the positive, “what is” (Páez et al., 2012). A lack of comprehensive research regarding equity in long-distance travel could be a result of focus on foci, i.e. not accounting for latent or unserved demand. These concepts play into the differences between the study of actual and unmet need for long-distance travel. Traditional methods of studying transportation equity have focused on what we can observe but do not reveal the need for long-distance travel, one that is there but not always measured and addressed. Because travel models are constructed using observed travel behavior and data, it is necessary to proactively “investigate known sites of inequity on the basis of local knowledge,” in addition to creating partnerships and engaging in coalition building as a way to represent those that are typically underserved (Karner & London, 2014).
Finally, the word *equity* itself can sometimes create a barrier to establishing solid research approaches for robust analysis. Equity can sometimes serve as an umbrella term, encompassing themes such as fairness, equality, and ideological correctness. Nonetheless, the concepts of equity and justice have gone hand in hand theoretically.

Sufficientarianism, as it refers to equity, is one philosophical concept which says that we should be concerned with ensuring individuals have *just enough* (Gosseries, 2011), although this is a highly subjective measure. Issues with this theory on equity arise because there is no definitive threshold for one’s needs (Casal, 2007). This is especially true under the application of transportation policy and planning regarding underprivileged groups since they are frequently underrepresented in discussions and recruitment efforts to bring them into policy discussions can prove to be difficult. Lucas et al. (2016) examine John Rawls’ *A Theory of Justice* and sufficientarianism alongside transportation equity to conclude that policy should strive to provide the greatest benefit to the least well-off and all should be given the opportunity to reach some minimum level of well-being which is necessary to satisfy basic needs. Prior to this thesis, there have been limited efforts to measure or study basic unmet needs for intercity or long distance travel in the United States. One can suppose that access to opportunities, culture, and services, as well as the creation or maintenance of social networks, may require out-of-town travel but efforts to measure unserved needs or desires are limited and overshadowed by the study of more routine or daily sustenance needs.

Alternatively, equity is often divided into two categories: horizontal and vertical. The former is defined by equal access or resources for those that have the same level of
need, and the latter is based on the idea that individuals should receive resources or services in proportion to their need (Waters, 2000). A second source uses the field of transportation to specifically define horizontal equity and divide vertical equity into two categories: vertical with respect to income and social class, and vertical with respect to mobility need and ability (Litman, 2003). Here horizontal equity “concerns the distribution of impacts between individuals and groups considered equal in ability and need” (Litman, 2003). Vertical with respect to mobility need and ability refers to creating transportation facilities that have a universal design, while vertical with respect to income and social class favors the “economically and socially disadvantaged groups” to account for overall inequities. In this thesis, equity refers to situations where individuals are given equal access to basic necessities and equal chances to utilize various opportunities, with a focus on the potential of providing more to those underserved in order to compensate for the access gap of different socioeconomic classes. Without knowing the extent of unmet travel need among certain underserved groups, it is difficult to determine just how large the gap is between those who have their long-distance travel needs met and those who do not. For this research unmet need for long distance travel is measured quantitatively in a survey form within the datasets used in Chapter 3 and 4, but interviews are used to probe deeper into the concepts around need and unserved demand which are as yet understudied in the field.

The equity in access to long-distance travel has not been studied extensively, and it certainly has not been studied in terms of its relationship to one’s social networks. This thesis proceeds from this chapter into an article titled, *Exploring Vermonter’s Self-
Reported Unmet Long-Distance Travel Need, which is followed by a second article titled, Exploring the Role of Long-Distance Travel for the Well-being of Women in Vermont.

Finally, the thesis closes with a fifth chapter containing a summary of contributions which are drawn between the two articles as well as the future research directions implied by the findings. Chapter 3 answers the research questions (1) Does the amount of long-distance travel undertaken vary by income group, home location, cell phone and internet access, and (2) How are income and home location related to whether an individual has unmet long-distance travel needs? These questions are examined using data from a statewide 2016 Vermont Agency of Transportation Long Range Transportation Planning Survey (LRTPS) survey. Five models using ordinal logistic regression are created to help consider which characteristics contribute to one being long-distance travel disadvantaged. Chapter 4 answers the questions (1) How does the ability to participate in long-distance travel affect well-being and extent of one’s social network geography for lower-income women, and (2) What are the barriers to accessing long-distance travel for this group? Lower-income women were selected for the study because they are one of the typically underserved people groups. Other underserved groups were considered, however, given limited resources including time, it was necessary to target a group where it was possible to reach a large enough participant pool. Chapter 4 also uses a unique “geography of your social network survey” which includes questions about level of current intercity travel as well as unmet needs and locations of social contacts. Because many accessibility and mobility indicators are subjective, too often there is a prescriptive undertone in the way that research on equity is undertaken. The complexity of the
transportation system and the challenges of measuring access and equity to long-distance destinations dictate the decision to use a relatively open-ended interview format to gain a better first understanding of this understudied topic and the factors that affect demand and latent demand for long distance travel.

References


EXPLORING VERMONTERS’ SELF-REPORTED
UNMET LONG-DISTANCE TRAVEL NEED

Abstract
In the United States, studies of transportation equity focus on affordable access to local destinations and basic services. But access to out-of-town destinations also plays a role in equity and overall well-being. The limited studies of long-distance intercity travel focus on observed demand, leaving out latent or unmet demand. This study explores factors which impact unmet long-distance travel demand using 2,232 responses from a 2016 state-wide survey of Vermonters which included measures of self-reported long-distance travel as well as indicators of unmet local and long-distance travel needs. A total of 22 percent of respondents indicated they had unmet demand at least once per year. Furthermore, there was a significant correlation between those who had unmet demand within Vermont and outside of Vermont, proxies for local and intercity travel, respectively. Five ordinal logistic regression models were estimated. Income level, Internet access, and education level were found to be significant predictors of realized long-distance travel. Household size and composition, household vehicles, age, income, and self-reported urban residence were predictors of both unmet local and long-distance travel need. In addition, full-time employment was significant for local unmet need, while miles to the nearest metropolitan area was a significant predictor for longer travel needs. Models of actual travel were stronger than for unmet demand, indicating that other unmeasured predictor variables may be important. Recommendations include using
qualitative methods to examine associated factors that may be unmeasured in travel surveys.

**Introduction**

Long-distance travel may be defined by a roundtrip distance of at least 100 miles (1), although definitions vary and there has been much discussion on whether a single distance threshold is sufficient to consider the diverse range of travel that occurs within the global multimodal transportation system (2). Moreover, daily travel that is more local and routine in nature, has been studied to a greater extent due, in part due to availability of data. Studies on the equity and access for underserved individuals have also primarily focused on local, daily travel since the need for this type of travel is tied to access to employment and essential services. Nonetheless, with increasingly dispersed social networks due to migration and telecommunications, increased demand for long-distance, intercity travel may reflect more than just increased business travel and purely discretionary leisure or vacation trips. Intercity travel for personal reasons, including family obligations, may be increasingly important within all social networks. In 2017, growth in passenger air travel was predicted at an average of 2.8 percent from 2017 to 2037, with certain global regions forecasted to increase by 3.9 percent each year (3). With the large expected increases in passenger air travel, inequities in access to inter-regional or inter-continental destinations may be exacerbated.

This paper argues that long-distance travel is an understudied piece of one’s travel profile that may be important in provision of access to social capital and well-being. As one scholar phrased it, those who “do better” in life are “better connected” (4).
When underprivileged groups have limited access to long-distance, intercity travel, their ability to maintain and build new ties in their social network is restricted, resulting in inequity. Groups that may be underserved include those of lower socioeconomic status, as well as those who fit other underserved groups defined by age, gender, disability, race, or immigration status.

Travel surveys, whether for local or long-distance travel, by their nature typically query for actual trips resulting in the study of those who have undertaken travel and the attributes of those realized trips. These siloed datasets are analyzed without consideration for those who make few or no such trips. This situation may be exaggerated for surveys of lower frequency long-distance travel and therefore cause skewed measures of long-distance travel need. Travel behavior analysis, for both local and long-distance travel, often fails to consider latent demand or unmet need, neither acknowledging it nor measuring the extent to which it occurs. To the knowledge of this paper’s authors, there is no study that examines the difference between those who can and do participate in long-distance travel, and those that would like to but cannot participate. This paper examines the following research questions:

1. What is the extent of unmet demand for long-distance travel?
2. Is unmet long-distance travel need correlated with the unmet need for local travel?
3. How does long-distance travel need vary with socioeconomic, geographic, and household characteristics?

This study uses survey data collected from 2,232 residents of the state of Vermont to consider the different sociodemographic attributes that contribute to levels of actual self-
reported long-distance travel and unmet demand as well as the correlation between the two. Five ordinal logistic regression models are used to examine self-reported long-distance travel frequency as well as both local and intercity unmet travel need. Figure 1 illustrates the relationship between various predictor categories and the outcome variable of either level of accessibility and mobility or unmet travel demand. Note that not all examples in each predictor category are used due to data availability.

Figure 1. Theoretical framework for long-distance travel models

Prior Research

The background for this project includes consideration of four interrelated topics: long-distance travel data, underserved groups, travel demand models, and travel and overall well-being.
Long-distance Travel Data

Though there has been extensive study of local daily travel patterns in one’s home region, long-distance, intercity travel has not received the same focus, in part due to a lack of adequate data. Two of the most comprehensive national datasets on long-distance travel are the 1995 American Travel Survey (ATS) (n=80,000 households), which included one year of travel for trips of at least 100 miles one-way, and the 1995 Nationwide Personal Transportation Survey (NPTS) (n=42,033 households). The 2001 National Household Travel Survey (NHTS) included an 8-week retrospective of trips to destinations more than 50 miles from home. The 2009 NHTS included data on trips taken within a 24-hour period but no focused effort to collect less frequent intercity trips. Many researchers advocate for a full year of data collection (5), but many surveys have used more limited recall periods. The recent California Household Travel Survey (CHTS) long-distance component used 8-weeks (6). The 2016 NHTS, which is not yet released, does not include long-distance trips outside of those occurring on the assigned travel day. Other states have collected long-distance travel data in dedicated surveys including Ohio (7), Michigan (8), and Utah (9). Ohio is of particular note because the data were collected over a 3-month period using a smart phone app. No survey efforts have included measures of the latent demand or unmet need for long-distance travel.

Underserved Groups

Certain population groups are often missed or masked in national trends that are usually reported in terms of total vehicular or passenger volumes and average travel times. Often those that are disadvantaged in terms of access and mobility include women, children, the
elderly, minorities, refugees or immigrants, disabled persons, and the poor. Carrying out long-distance travel becomes more difficult when many of these groups have the underlying disadvantage of lower income, although income can also be a standalone factor. Several studies have used available data to describe the factors that determine who does long-distance travel. The 1995 ATS demonstrated that those with higher income make more long-distance trips, approximately three times more when compared to those of very low income (10). Limtanakool et al. (11) found that those of higher socioeconomic status in the UK and the Netherlands traveled more for both medium and long-distance trips. A more recent study also concluded that the extent of long-distance travel was highly related to income (12). Groups that typically participate less in long-distance travel in Great Britain were women and the elderly. Those who traveled more were employed and from smaller households or those with fewer children. Aultman-Hall et al. (2) and LaMondia et al. (13) both find that levels of long-distance and overnight travel are highly variable but that socioeconomic factors, employment, and spatial factors all impact the amount of travel. Larsen et al. (14) found that the amount of long-distance travel was related to income as well as network capital and the existence of spatially distant social ties. Larsen et al. (14) and Aultman-Hall et al. (2) both found a propensity for hybrid or mixed work and personal trip tours. Travel for work is not an opportunity everyone has.

Certain geographies may also play a role in the amount of actual long-distance travel completed. Though this project’s study area, Vermont, has several mode choices that are suited to long-distance travel other than personal vehicle, these options are
located in the most densely populated towns and cities. In 2010, 38.9 percent of Vermont’s population was urban (15), making car-ownership an important factor for many Vermonters in both local and long-distance travel. Air, rail, and bus service in the state is limited. One study found that those living in small towns or areas of low population density completed fewer long-distance trips and that those trips were shorter in distance than trips made by those living in more urban areas (16). Land use attributes such as population density and travel time to destinations were among the reasons for differences in mode choice for medium- and longer-distance trips (11). Private car and train were both used for medium-distance business and leisure trips whereas the study reported longer-distance trips were predominantly taken by private vehicle when commuting, but some by train when for leisure. Where train stations were present, those with higher education or with low-income tended to travel by train. However, as noted in a recent TRB special report, the automobile dominates travel in the 100 to 500 mile range and that option is not available to those without an automobile (17). Thus, without mode choices, certain disadvantaged groups may be engaging in less long-distance travel.

Another study points out that those living farther from urban centers must travel further distances to reach opportunities in metropolitan areas. In communities where the car is “king,” it was found that there is a mismatch between available transportation and actual social needs (18). Researchers found evidence for forced-car-ownership (FCO) households that were characterized by their high dependence on personal vehicles due to their housing location on the outskirts of Australian metropolitan areas. These
households made fewer trips than those living closer to urban areas, suggesting that although households own personal vehicles, some travel is still prohibitive to them.

**Travel Demand Models**

Many travel demand models are still based on the four-step process, a framework that is often better suited for shorter-distance trips. Traditional models begin with trip generation, or the number of trips one intends to make; trip distribution to destinations; mode choice; and route assignment (19). This framework remains the basis for most state-wide planning models and helps to inform transportation planning and policy decisions by predicting future travel demand. According to the Federal Highway Administration (FHWA), interest in long-distance travel at the state and federal levels has been increasing in recent years, especially regarding air travel, high-speed rail, and improvement of highway infrastructure (20). However, predicting the true future need for long-distance travel may be difficult when only certain sociodemographic groups currently dominate this type of travel. Recently, the National Cooperative Highway Research Program supported development of rural and long-distance travel model parameters (21). The FHWA supported the development of an activity-based national travel demand model (22) and a county-to-county travel origin-destination matrix (23); but the source data used for calibration in all three projects were limiting and dated.

The widely used frameworks for travel demand models only include revealed demand that has occurred or is *acted upon*. The models and data collection therefore exclude those who are transportation disadvantaged and who lack the access and mobility necessary to carry out long-distance trips. Unmet long-distance travel demand may affect
more than just immediate well-being as both are hypothesized to be necessary for the creation and maintenance of social capital.

**Travel and Overall Well-being**

While the impact of long-distance travel on well-being has not yet been extensively studied, several connections have been made to its importance, mainly due to the increased spatial spread of social networks (24). Thus, long-distance travel may be considered a necessity as “corporeal” travel will never be phased out by technological advances because of the human desire for physical proximity to people, places, and events, in addition to needing to travel for reasons where physical travel is unavoidable, such as for legal, economic, familial, social, place-based, and live obligations (25). Urry also argues that travel is a fundamental human right; as a result, increased local travel or use of technology for communication may not be able to fully replace long-distance travel.

The concept that travel as a derived demand means that we travel as a means to participate in activities located at destinations across space. Others alternatively argue that travel is the activity — that travel is undertaken for the sake of traveling (26). Examples of this include driving scenic roads and walking or biking for exercise. Mokhtarian and Salomon (26) argue that longer routes are taken sometimes because of the “variety-seeking” nature of humans. They continue by saying that part of the utility derived from travel may have to do with the other activities one can do while participating in travel, such as reading while riding on a train. The authors argue that humans have some degree of intrinsic desire to travel. Whether humans desire travel as
an activity or as a means to go somewhere, it does not change how our culture understands the demand behind long-distance travel. If travel is a derived demand, from a Neoclassical economic standpoint, one might say that low-income people demand less leisure travel because they do less travel, though the amount of travel may not be their choice.

One recent study found that while unserved travel demand for local, routine types of travel was not common, its effect on one’s quality of life was significant and negative (27). The suggestion was made that those who experience unmet travel needs were less likely to overcome mobility challenges due to being part of a social network where many others were also transportation disadvantaged.

In a study conducted in the San Francisco Bay area on long-distance travel, 63 percent of people said that they felt positive about long-distance travel, a higher percentage than short-distance travel (26). When asked how much more one would like to travel, about 55 percent said that they wanted more travel, 35 percent wanted their travel to stay the same, and about 10 percent wanted less travel. While the study was looking to examine travel for travel’s sake, the authors admit that it is likely that participants still associated traveling with its destination.

The concept of social exclusion can also be connected to overall subjective well-being since those who are excluded may feel lower levels of happiness. In one study, those who were found to be at risk of social exclusion exhibited traits such as not feeling a strong sense of community, had lower incomes, and less mobility (28). Those at risk also lacked regular contact with significant others and had less contact with immediate
and extended family members. While not necessarily examining long-distance travel, the study found that those at risk of social exclusion made fewer and shorter distance trips. Thus, social exclusion is not a result of “lack of social opportunities but a lack of access to these opportunities (29).”

**Summary**

Research on the extent and effects of the unmet long-distance travel on numerous underserved groups is limited. This lack of knowledge may be attributed to lack of data or the traditional modeling approach used in transportation. This paper will begin to examine the issue by defining what factors affect long-distance travel and to what extent unmet need persists.

**Data**

The survey data used in this study was collected by Resource Systems Group, Inc. (RSG) for the Vermont Agency of Transportation (VTrans) in 2016. The random address-based sample was recruited only in Vermont using a series of two mail contacts. The first postcard directed participants to an online survey, while the second mailing also included a paper mail-back survey. The household member who most recently had a birthday and was over 18 years of age was instructed to complete the survey. Of the final sample (n=2,232), 42 percent were completed online and 58 percent were paper surveys.

In 2016, Vermont’s population was 624,594 (15) making it the second least-populated state in the U.S. Most of Vermont is rural or made up of small town centers, with the exception of the Burlington-South Burlington metropolitan statistical area.
(MSA) with an estimated population of 161,500 (15). The sample was distributed among five Vermont regions, each containing a minimum of 347 surveys.

The primary purpose of this public opinion survey was to inform the Vermont Long Range Transportation Plan (LRTP) but many of the questions were also formulated for specific research projects. Data were gathered using 43 questions on the following topics: travel behavior, customer satisfaction, policy and funding opinions, emerging trends in technology, and sociodemographic variables. Several unique questions about long-distance travel and unmet travel need were included in the survey. Respondents were asked how frequently they did each of the following:

1. Made a trip that had a destination in Canada
2. Made a trip that had a destination outside the U.S. or Canada
3. Used commercial air services
4. Needed to travel to a destination inside Vermont but could not due to lack of transportation options
5. Needed to travel to a destination outside Vermont but could not due to lack of transportation options

The first three frequency measures represent self-reported, realized travel. The fourth and fifth measures are used in this paper as a proxy for local and long-distance, intercity travel, respectively. For the first question, Canada was specified because Quebec, Canada forms Vermont’s northern border. The major city of Montreal is about 53 miles from the border and is the closest large metropolitan destination for much of Northern Vermont.
Frequency in these questions was measured using a 5-point Likert scale:

1. Never

2. Very infrequently (one time per year or less)

3. Infrequently (multiple times per year)

4. Frequently (multiple times per month)

5. Very frequently (multiple times per year)

Table 1 summarizes the frequency distributions of responses. The categories for very frequently and frequently were combined into one “frequently” category to ensure large enough frequencies for the regression models estimated later in the paper. The number of observations varies because some participants did not answer every question.
Table 1. Self-reported long-distance travel frequency

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Made a trip that had a destination in Canada</td>
<td>Never</td>
<td>929</td>
<td>42.7</td>
</tr>
<tr>
<td>(Model 1) n=2118</td>
<td>Very infrequently (1 time per year or less)</td>
<td>934</td>
<td>42.9</td>
</tr>
<tr>
<td></td>
<td>Infrequently (multiple times per year)</td>
<td>267</td>
<td>12.3</td>
</tr>
<tr>
<td></td>
<td>Frequently (multiple times per month)</td>
<td>39</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>Very Frequently (multiple times per week)</td>
<td>7</td>
<td>0.3</td>
</tr>
<tr>
<td>Made a trip that had a destination outside the U.S. or Canada (Model 2) n=2164</td>
<td>Never</td>
<td>1207</td>
<td>56.0</td>
</tr>
<tr>
<td></td>
<td>Very infrequently (1 time per year or less)</td>
<td>805</td>
<td>37.3</td>
</tr>
<tr>
<td></td>
<td>Infrequently (multiple times per year)</td>
<td>132</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td>Frequently (multiple times per month)</td>
<td>9</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Very Frequently (multiple times per week)</td>
<td>3</td>
<td>0.1</td>
</tr>
<tr>
<td>Frequency of using commercial airlines (Model 3) n=2020</td>
<td>Never</td>
<td>583</td>
<td>28.6</td>
</tr>
<tr>
<td></td>
<td>Very infrequently (1 time per year or less)</td>
<td>873</td>
<td>42.8</td>
</tr>
<tr>
<td></td>
<td>Infrequently (multiple times per year)</td>
<td>519</td>
<td>25.4</td>
</tr>
<tr>
<td></td>
<td>Frequently (multiple times per month)</td>
<td>56</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>Very Frequently (multiple times per week)</td>
<td>11</td>
<td>0.5</td>
</tr>
<tr>
<td>Need to travel to a destination inside Vermont but can’t due to lack of transportation options (Model 4) n=2178</td>
<td>Never</td>
<td>1785</td>
<td>82.4</td>
</tr>
<tr>
<td></td>
<td>Very infrequently (1 time per year or less)</td>
<td>188</td>
<td>8.7</td>
</tr>
<tr>
<td></td>
<td>Infrequently (multiple times per year)</td>
<td>109</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>Frequently (multiple times per month)</td>
<td>51</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td>Very Frequently (multiple times per week)</td>
<td>34</td>
<td>1.6</td>
</tr>
<tr>
<td>Need to travel to a destination outside Vermont but can’t due to lack of transportation options (Model 5) n=2070</td>
<td>Never</td>
<td>1783</td>
<td>82.2</td>
</tr>
<tr>
<td></td>
<td>Very infrequently (1 time per year or less)</td>
<td>212</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td>Infrequently (multiple times per year)</td>
<td>109</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>Frequently (multiple times per month)</td>
<td>37</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>Very Frequently (multiple times per week)</td>
<td>27</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Those who had unmet local need versus unmet long-distance travel need did not completely overlap, although there was some. Table 2 shows the crosstabulation between
these two variables. A Chi-square test was conducted and the association between the
two variables was found to be significant (p<0.001). While about 78 percent of
respondents report never having had unmet travel need inside or outside Vermont due to
lack of transportation options, 22 percent reported unmet need either inside or outside of
Vermont, or both, at least once per year. However, this does not take into account unmet
travel demand that is due to other factors beyond transportation options.

Table 2. Crosstabs of unmet travel demand inside and outside Vermont

<table>
<thead>
<tr>
<th>Frequency of Travel Need Inside Vermont</th>
<th>Frequency of Travel Need Outside Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>78.3%</td>
</tr>
<tr>
<td>Infrequently</td>
<td>3.7%</td>
</tr>
<tr>
<td>Frequently</td>
<td>0.3%</td>
</tr>
<tr>
<td>Infrequently</td>
<td>4.0%</td>
</tr>
<tr>
<td>Frequently</td>
<td>8.4%</td>
</tr>
<tr>
<td>Frequently</td>
<td>1.2%</td>
</tr>
<tr>
<td>Frequently</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

Table 3 summarizes the categorical variables that were considered for inclusion as
predictor variables in the models. Many variable categories were combined or converted
to dummy variables in order to construct the models. Table 3 shows the categorical
variables as they were collected. Using the income variable two dummy variables were
created, one for high income (≥$150,000 per year) and one for low income (< $50,000).
Survey data for age was originally birth year and age in years. Two dummy variables
were constructed: one which indicated respondents 65 years of age and older, and one
with respondents aged 18 to 34 years. Lack of Internet access in this study pertains to not
having access using any method, whether on a cell phone, at a public place, at work, or
home. Overall the sample was relatively well-balanced. A majority of the sample were
middle-aged or older, with only 12 percent under 34 years old. There were also only
small percentages of typically underserved groups; only 4 percent of the sample were unemployed, and about 8 percent did not have any kind of Internet access. Geographically, there were a smaller percentage of people reporting that they lived in a city environment than was reported by the U.S. Census.

Table 3. Categorical predictor variables considered for models

<table>
<thead>
<tr>
<th>Categorical Variable</th>
<th>Reference Category</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>18-34 years old</td>
<td>248</td>
<td>11.6</td>
</tr>
<tr>
<td></td>
<td>35-64 years old</td>
<td>1163</td>
<td>54.3</td>
</tr>
<tr>
<td></td>
<td>65 years and older</td>
<td>730</td>
<td>34.1</td>
</tr>
<tr>
<td>Child(ren) in Household (≤17)</td>
<td>Yes</td>
<td>419</td>
<td>20.8</td>
</tr>
<tr>
<td>Education</td>
<td>4-year degree or higher</td>
<td>1069</td>
<td>50.3</td>
</tr>
<tr>
<td>Employed Full-time</td>
<td>Yes</td>
<td>955</td>
<td>43.1</td>
</tr>
<tr>
<td>Retired</td>
<td>Yes</td>
<td>762</td>
<td>34.4</td>
</tr>
<tr>
<td>Self-employed</td>
<td>Yes</td>
<td>271</td>
<td>12.2</td>
</tr>
<tr>
<td>Unemployed</td>
<td>Yes</td>
<td>92</td>
<td>4.1</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>1126</td>
<td>52.6</td>
</tr>
<tr>
<td>Income</td>
<td>Less than $15,000</td>
<td>164</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>$15,000 to $24,999</td>
<td>177</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td>$25,000 to $34,999</td>
<td>179</td>
<td>9.9</td>
</tr>
<tr>
<td></td>
<td>$35,000 to $49,999</td>
<td>266</td>
<td>14.7</td>
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<td></td>
<td>$50,000 to $74,999</td>
<td>391</td>
<td>21.6</td>
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<td></td>
<td>$75,000 to $99,999</td>
<td>285</td>
<td>15.7</td>
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<td></td>
<td>$100,000 to $149,999</td>
<td>233</td>
<td>12.9</td>
</tr>
<tr>
<td></td>
<td>$150,000 to $199,999</td>
<td>67</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>$200,000 or more</td>
<td>50</td>
<td>2.8</td>
</tr>
<tr>
<td>Internet</td>
<td>No access</td>
<td>165</td>
<td>7.5</td>
</tr>
<tr>
<td>Self-reported Neighborhood Type</td>
<td>City, downtown</td>
<td>99</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>City, residential neighborhood</td>
<td>247</td>
<td>11.2</td>
</tr>
<tr>
<td></td>
<td>Suburban, mix of shops and houses</td>
<td>171</td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td>Suburban, houses only</td>
<td>295</td>
<td>13.4</td>
</tr>
<tr>
<td></td>
<td>Small town or village</td>
<td>669</td>
<td>30.5</td>
</tr>
<tr>
<td></td>
<td>Rural area</td>
<td>716</td>
<td>32.6</td>
</tr>
<tr>
<td>Single Person Household</td>
<td>Yes</td>
<td>594</td>
<td>28.4</td>
</tr>
</tbody>
</table>

Note: Only one category is shown for binary variables.
Only two continuous variables collected in the survey were considered: household size (mean 2.2 and standard deviation 1.1) and number of household vehicles (mean 2.0 and standard deviation 1.3). Two additional variables were created using home addresses provided by survey respondents. Miles to the nearest major airport (those with \( \geq 500,000 \) enplanments per year) was calculated by using the straight-line distances from home to airport using ArcGIS. The nearest major airports used were Logan International Airport in Boston, MA (approx. 98 miles from VT border), Bradley International Airport in Windsor Locks, CT (approx. 67 miles from VT border), Manchester-Boston Regional Airport in NH (approx. 72 miles from VT border), and Burlington International Airport in northwestern Vermont. The mean distance was 40.0 miles (SD = 57.0). The other continuous variable calculated using ArcGIS was the number of miles to the nearest MSA. The MSA’s used were Burlington-South Burlington, VT, Albany-Schenectady-Troy, NY, Springfield, MA, and Manchester-Nashua, NH. The mean distance to an MSA was 38.7 miles (SD = 55.8).

**Methodology**

The goal of this analysis was to understand the factors related to the frequency of long-distance travel and unmet long-distance travel demand by using ordinal logistic regression models. This type of regression was chosen because the outcome variables (Table 1) contain response categories that are ordinal in nature.

The first step in model development was to consider which variables might reasonably affect one’s long-distance travel behavior or unmet demand based on available literature. For categorical predictors, Chi-square tests were used to assess
whether categorical variables were associated with one another, continuous predictors were tested for correlations with one another using a Pearson’s correlation test, and independent sample t-tests were used for testing categorical variables against continuous ones.

The models were created using a backward stepwise method — the process of entering all variables into a model and removing the least significant variables one by one until all variables in the model are statistically significant at p<0.05. When a pair of significant variables in the model were correlated at the 0.05 level using the tests above, the variables were both retained only if the magnitude of each parameter was stable when the other variable was excluded in turn and models were re-estimated. For each of the final models, odds ratios for each of the statistically significant variables are presented due to their ease of interpretation. The McFadden pseudo $R^2$ value was used to assess alternative models and to indicate the strength of the final models.

**Results**

Models 1, 2, and 3 of self-reported travel had final McFadden $R^2$ values of 0.13, 0.12, and 0.12, respectively. Models 4 and 5 of unmet travel need overall had lower McFadden $R^2$ values of 0.09 and 0.06, respectively. This may signify that unmet need has more variation and/or that the independent variables available for testing in the models concerning unmet travel need were less adequate compared to those that were able to predict actual likelihood of traveling.
Tables 4 and 5 present the five models and their odds ratios and p-values for each of the variables found significant. The coefficients for predictor variables that were not significant were not included in the table and are represented by a dash.

**Table 4.** Ordinal logistic regression models of travel

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th><strong>Trip Destination in Canada</strong></th>
<th><strong>Trip Destination outside U.S. or Canada</strong></th>
<th><strong>Commercial Air Travel Use</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio</td>
<td>p</td>
<td>Odds ratio</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed full-time</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Retired</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Self-employed</td>
<td>-</td>
<td>-</td>
<td>1.660</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0.228</td>
<td>0.000</td>
<td>0.384</td>
</tr>
<tr>
<td>Geography</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miles to nearest major airport</td>
<td>0.980</td>
<td>0.000</td>
<td>-</td>
</tr>
<tr>
<td>Miles MSA</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rural residence</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Urban residence</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Household Characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child(ren) in HH</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HH Size</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HH Vehicles</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Income: &lt; $50,000</td>
<td>0.589</td>
<td>0.000</td>
<td>0.513</td>
</tr>
<tr>
<td>Income: ≥ $150,000</td>
<td>2.299</td>
<td>0.000</td>
<td>3.354</td>
</tr>
<tr>
<td>No Internet Access</td>
<td>0.325</td>
<td>0.000</td>
<td>0.252</td>
</tr>
<tr>
<td>Single Person Household</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Attributes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age: 18 to 34</td>
<td>0.640</td>
<td>0.003</td>
<td>-</td>
</tr>
<tr>
<td>Age: ≥ 65 years</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4-year degree or higher</td>
<td>3.189</td>
<td>0.000</td>
<td>3.017</td>
</tr>
<tr>
<td>Female</td>
<td>0.718</td>
<td>0.001</td>
<td>-</td>
</tr>
<tr>
<td><strong>Threshold 1</strong></td>
<td>0.340</td>
<td>0.000</td>
<td>1.794</td>
</tr>
<tr>
<td><strong>Threshold 2</strong></td>
<td>4.819</td>
<td>0.000</td>
<td>30.970</td>
</tr>
<tr>
<td><strong>Threshold 3</strong></td>
<td>46.438</td>
<td>0.000</td>
<td>436.689</td>
</tr>
</tbody>
</table>

| N                  | 1595       | 1587   | 1521      |
| McFadden $R^2$     | 0.126      | 0.116  | 0.124     |
Note: A dash in a column indicates that the predictor variable was not significant at the 0.05 level.
Table 5. Ordinal logistic regression models of unmet travel need

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>Unmet Need Within Vermont</th>
<th>Unmet need Outside Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio</td>
<td>p</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed full-time</td>
<td>0.529</td>
<td>0.000</td>
</tr>
<tr>
<td>Retired</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Self-employed</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Unemployed</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miles to nearest major airport</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Miles MSA</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rural residence</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Urban residence</td>
<td>1.894</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Household Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child(ren) in HH</td>
<td>0.462</td>
<td>0.003</td>
</tr>
<tr>
<td>HH Size</td>
<td>1.226</td>
<td>0.024</td>
</tr>
<tr>
<td>HH Vehicles</td>
<td>0.690</td>
<td>0.000</td>
</tr>
<tr>
<td>Income: &lt; $50,000</td>
<td>2.431</td>
<td>0.000</td>
</tr>
<tr>
<td>Income: ≥ $150,000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No Internet Access</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Single Person Household</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Personal Attributes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age: 18 to 34</td>
<td>1.493</td>
<td>0.035</td>
</tr>
<tr>
<td>Age: ≥ 65 years</td>
<td>0.550</td>
<td>0.001</td>
</tr>
<tr>
<td>4-year degree or higher</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Female</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Threshold 1</strong></td>
<td>3.575</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Threshold 2</strong></td>
<td>9.162</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Threshold 3</strong></td>
<td>24.254</td>
<td>0.000</td>
</tr>
<tr>
<td>N</td>
<td>1592</td>
<td></td>
</tr>
<tr>
<td>McFadden $R^2$</td>
<td>0.085</td>
<td></td>
</tr>
</tbody>
</table>

Note: A dash in a column indicates that the predictor variable was not significant at the 0.05 level.
Discussion

Factors that Affect Realized Travel

Employment
The models on actual travel demand indicated that unemployment was a significant
determinant in doing less travel to Canada, outside the U.S. and Canada, and by
commercial airplane in general. Unemployed persons were less likely to travel to Canada
or outside of the U.S. or Canada when compared to those who were employed. They
were also less likely to use commercial air travel. Self-employment was a significant
indicator of increased travel internationally and by air. These respondents were more
likely to travel to destinations outside the U.S. and Canada and more likely to use
commercial air travel. However, distinct from these, the variables for being employed
full-time or retired were not found significant.

Geography
For the three models of realized long-distance travel, miles to the nearest airport was only
found to be significant for trips with destinations in Canada. The further a respondent
lived from the airport, the less likely they were to travel into Canada. This may be due to
either being closer to urban centers other than Montreal, or because respondents use air to
travel to destinations at further distances than Quebec. Note that miles to the nearest
major airport and miles to the nearest MSA were found to be significantly correlated with
one another therefore each predictor is only included in one model. The stronger
predictor was chosen. Additionally, those with self-reported urban residence were more
likely to use commercial air travel than non-urban dwellers.
Household Characteristics

All three models of realized travel had low-income, high-income, and Internet access as significant predictors. Those with household incomes less than $50,000 were less likely to travel to destinations in Canada, outside the U.S. and Canada, or to use air travel. In contrast, high income households making at least $150,000 were more likely to travel to Canada, outside the U.S. and Canada, and to use air travel. These results are consistent with prior work that, lower household income is a barrier for participation in long-distance travel.

Having no Internet access was also a significant predictor of lower participation in long-distance travel. Those without Internet were less likely to travel to Canada, less likely to travel internationally, less likely to travel by air. While income and Internet access were found to be significantly correlated, the lower odds ratio for international travel for those without Internet access suggests that Internet access may play an important role in the ability to do international trip planning, including securing better rates and understanding everything that is entailed with traveling to international destinations.

Household characteristics that were not found to be significant predictors were children, single person household, and the number of vehicles per household. Household size was a significant predictor only for commercial air travel whereas when household size increases, one is less likely to use air travel.
Personal Attributes

As expected, having at least a 4-year degree was a significant predictor of long-distance travel. Those with higher education were more likely to travel to Canada, more likely to travel internationally, and more likely to use air travel. Those who thought passenger rail services were either very important or important were also more likely to travel internationally.

Female respondents were less likely to travel to Canada than men. Younger respondents aged 18 to 34 years were also less likely to travel to Canada.

Factors that Affect Unmet Travel Need

Employment

Full-time employment status was found to be a significant predictor of unmet travel need. Those with full-time employment were less likely to have unmet travel demand within Vermont, however, this was not a significant predictor for destinations outside of Vermont. Neither retirement, self-employment, nor unemployment were individually found to be significant predictors of having unmet travel demand.

Geography

Those in self-reported urban residences were found to be more likely to have unmet need inside and outside Vermont. The similar odds ratios may suggest that those with local and intercity unmet need are the same people (consistent with Table 2). This may be due to lack of public transportation options in Vermont or factors associated with urban poverty that differ from rural poverty such as forced car ownership. Miles to the nearest MSA was also significant. Respondents who lived further from an MSA were more
likely to have unmet need outside of Vermont, suggesting in contrast to the above that more rural areas have greater unmet demand.

**Household Characteristics**

Household size was found to be a significant predictor of unmet travel need. With each additional household member, households were more likely to have unmet need inside and outside of Vermont. Unsurprisingly, households with more registered vehicles had less unmet travel need. As the number of vehicles for a household increased, they were less likely to have unmet need inside and outside Vermont. Households with children 17 years and under also made a household less likely to have unmet need both within and outside of Vermont. While this seems unusual, it may be due to the fact that 74 percent of households with children in this sample have incomes of $150,000 or greater. High income, single person households, and not having Internet access were not individually found to be significant predictors of unmet travel need.

**Personal Attributes**

Older age was found to be a significant predictor of unmet need only within Vermont, with those 65 years and older being less likely to have unmet need. While this is contrary to other research, about 63 percent of older respondents in this sample also had incomes of at least $150,000. Conversely, those between 18 and 34 years were found to be more likely to have unmet need outside of Vermont, as well as within Vermont. Neither education nor gender were found to be significant factors in predicting unmet need, different from prior research and expectation.
Conclusions and Recommendations

This study sought to quantify how different sociodemographic and geographic attributes contribute to a level of actual and unmet long-distance travel demand. Models of realized travel frequency were able to predict a greater proportion of variance than models for unmet demand. A total of 22 percent of respondents specified that they had unmet demand at least once per year. Furthermore, there was a statistically significant correlation between those who had unmet demand within Vermont and outside of Vermont, proxies for local and intercity travel, respectively. This finding suggests that the same people who have unmet local demand also have unmet long-distance demand. The combination of variables that is statistically significant in the models suggest that both income level and home location are factors in levels of unmet need. Those with unmet need placed a higher importance on both passenger rail service and public transit suggesting that lack of non-automobile options are a factor in unmet intercity travel need. And while this study looked specifically at unmet demand that was caused by lack of transportation options there are many other potential reasons for unmet demand that should also be measured. Moreover, models of unmet demand were weak, weaker than those for realized demand, suggesting a need for different types of data.

This study demonstrates that there is a need for research to understand what factors affect the ability to do long-distance travel. New methods of data collection should be employed to investigate this issue as many existing data sources lack robustness for this purpose. While the data used here were not collected solely for the purpose of this study, future studies should work to seek out respondents who would like
to or need to travel, but cannot, and attempt to understand their circumstances.

Qualitative research in the form of interviews or focus groups may be one step in uncovering some of the more obscure aspects of unmet long-distance travel demand. Researchers could take a more holistic approach to the issue by examining not only realized human behavior but the psychology and social aspects which are intertwined with the act of long-distance travel. Qualitative research could also be used to inform future survey work and specific data that should be collected to more robustly model unmet need.

While research on transportation equity has been up to this point predominantly focused on local access to daily needs, this study demonstrates that long-distance travel among different socioeconomic groups is unequally distributed. There are indicators that this dataset is skewed towards those with more access suggesting that the rate of unmet need documented here may be understated. If transportation equity is viewed as “access to opportunity, [it] . . . serves as a key component in addressing poverty, unemployment, and equal opportunity goals” (29). Consequently, it may be that achieving long-distance travel equity and provision of equitable services may be a timely pursuit.

Acknowledgements

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survey design expertise of Mark Fowler, the survey contributions of Brian H. Y. Lee and Chester Harvey, and ArcGIS guidance and support from Sean Neely.

References


EXPLORING THE ROLE OF LONG-DISTANCE
TRAVEL FOR THE WELL-BEING OF WOMEN IN VERMONT

Introduction

Travel patterns and the needs or desires that contribute to them are very complex. Available quantitative data measuring long-distance travel provides only a limited sense of travel’s role in quality of life because datasets only include realized travel, not the unmet need or total desired demand for travel. Those who do not travel or think of themselves as travelers may not participate in data collection efforts, thereby limiting what we know about them even further. As a result, it is difficult to determine the extent of unmet long-distance travel demand and its impact on well-being, especially in populations who are underserved in terms of access and mobility.

While equity in access to local transportation options within one’s community has been a concern for transportation planners and researchers, less effort has gone into studying the unmet demand for long-distance travel. While telecommunications may be able to replace some of the need for in-person interaction, long-distance travel has a role in helping to create and maintain social capital, as well as in providing access to opportunities, cultural experiences, and various services. Many underserved populations may not have the means to travel to visit important people within their social network, thereby affecting their overall well-being. In this study, women are chosen as the focus as they are one group that has been shown to be disadvantaged when it comes to local travel. Women not only face lower incomes, but have additional challenges related to traditional gender roles. In general, women have been shown to travel less than men as a
result of having lower income, more household responsibilities, child-rearing duties, and less access to personal vehicles (Mallett, 1999). Accessibility for women can also be related to factors such as the lack of a driver’s license and being a single parent (Páez et al., 2012).

This paper uses both quantitative and qualitative data to provide an initial understanding of how participating, or not participating, in long-distance travel may affect one’s life. The quantitative section provides a traditional survey-based measure of long-distance travel by collecting self-reported frequency of different types of longer intercity trips. Surveys are also used to assess the extent or geography of a participant’s social network as well as their life satisfaction. The qualitative data consists of structured one-on-one interviews and seeks to uncover detailed descriptive information that is not available in most surveys. This information provides a valuable foundation in understanding unmet long-distance travel demand, an understudied aspect of travel behavior in our society. This paper examines the following research questions:

1. How does the ability to participate in long-distance travel affect well-being?
2. Is the extent of one’s social network geography related to travel and travel needs?
3. What are the barriers to accessing long-distance travel?

Following this section, the paper proceeds to cover prior research related to unmet travel need including discussing how social capital may be related to the ability to undertake long-distance travel. The concepts of well-being, face-to-face interaction, and the
inherent value of travel are included to illustrate why long-distance travel could be considered a necessity. The following sections discuss the three sources of data, quantitative and qualitative results, and the paper closes with a discussion and concluding remarks that address the significance of the role of intercity travel in well-being.

**Prior Research**

Accessibility is the “ability to reach desired goods, services, activities, and destinations” (Litman, 2003), as well as employment, social interaction, and entertainment opportunities (Páez et al., 2012). Mobility, on the other hand, can be defined as the speed and ease of traversing space by an individual using a mode of transportation to arrive at a desired destination (Litman, 2003). Transportation equity can be thought of as providing “access to opportunity [which] . . . serves as a key component in addressing poverty, unemployment, and equal opportunity goals” (Bullard, 2003). Another source defines equity as “the fairness with which impacts (benefits and costs) [of the transportation system] are distributed (Litman, 2002).

In the yet unpublished companion paper to this article, quantitative data on unmet long-distance travel demand, which has never before been available, is used to describe the extent of unmet demand in Vermont. Five ordinal logistic regression models were estimated for this purpose. The study also tests for correlation to see if those with unmet local need are the same respondents who also have unmet long-distance need. Finally, it characterizes those who travel against those with unmet need by socioeconomic, geographic, and household characteristics. Of the 2,232 responses from the Vermont state-wide survey, 22 percent of respondents indicated that they had unmet
demand at least once per year. Furthermore, there was a significant correlation between those who had unmet demand within Vermont and outside of Vermont, proxies for local and intercity travel, respectively. Attitude on the importance of passenger rail service, household size and composition, household vehicles, age, income, and self-reported urban residence were predictors of both unmet local and long-distance travel need. In addition, attitude on public transit and full-time employment were significant for local unmet need, while miles to the nearest metropolitan area was a significant predictor for longer travel needs. It was found that models of actual travel were stronger than for unmet demand, indicating that other unmeasured predictor variables could be important.

This paper uses qualitative methods to begin to gather data that could not be captured solely using quantitative methods. Using only quantitative methods simplifies the complex circumstances individual respondents face during both the short- and long-term. This may be one reason why the models on unmet demand were not as strong as for actual travel. While unmet demand has not been directly studied, this literature review demonstrates that it is reasonably a factor in well-being by considering: (1) social capital research, (2) well-being, and (3) the inherent value of travel.

**Social Capital**

While long-distance travel has been studied to some extent, there has not been a targeted focus addressing the practical importance of equity to opportunities at-distance and how it relates to one’s social network and social capital. Here social networks may be defined as “structures whose nodes represent people or other entities embedded in a social context, and whose edges [or links] represent interaction, collaboration, or influence
between the entities” (Liben-Nowell & Kleinberg, 2007). As such, social capital and social networks are concepts that are interrelated. The definition may be further extended to include the understanding that social capitals are the embedded resources within a social network, and may include things such as physical resources, emotional comfort, and anything that may further an individual’s personal endeavors or support them in some way (Lin, 1999). Social capital assets are found in social networks; this includes the access to resources which can be utilized through purposeful actions. When one builds social capital, they are investing in their social networks with the expectation that they will reap returns, whether in the form of physical resources, or other types (Lin, 1999).

In Lin’s (1999) social capital theory there are two types of actions that can be enacted within a network. One may use instrumental actions to obtain resources that are not already held by the actor, or one can use expressive actions to maintain resources already possessed. Here we might make the connection to long-distance travel by saying that long-distance travel may involve both expressive actions to maintain connections with friends, relatives, and otherwise important people, and instrumental actions to form new connections. Within a social network there are ties that connect individuals — these networks of connections can be very complex. Network ties may not always be geographically proximate to an individual, therefore prompting the need for telecommunication or long-distance travel.

Within social network analysis, there are many subareas of study, some of which are “the impact of urbanization on individual well-being, social support, community, and
occupational mobility” (Wasserman & Faust, 1994). Nonetheless, geography and social network subjects are sparsely addressed in the same academic paper. One study notes this and attempts to create models of social networks with the assumption that geography plays a role in the ties that individuals form (Daraganova et al., 2012). The paper reported that while shorter distances between actors tended to make forming a tie more likely, “at larger distances spatial and network processes operate slightly differently;” conclusions about the relationship between geography and the formation of ties became harder to predict using the models. Note that the maximum distance between respondents in this study was only about 185 miles. The idea of physical proximity making the creation of ties more probable stems from Festinger et al. (1950), however, this is a theory which was developed long before today’s global society, though it still seems to remain as reliable models are difficult to develop for larger distances.

We might hypothesize that a lack of access to long-distance travel that limits interregional mobility leaves some people at a disadvantage because they cannot maintain capital and they do not have as many opportunities to connect with those who are more advantaged than them. For example, those who have unmet travel demand were less likely to overcome mobility challenges due to being part of a social network where many others were also transportation disadvantaged (Kolodinsky et al., 2013). The tendency to associate with others of a similar socioeconomic status resulted in homogeneous ties which tended to be in a lower position in society (Lin, 2000). In Lin’s 2000 study, women were found to have a greater diversity of family ties than men, as well as more ties in number. However, their ties tended to be found lower in the social hierarchy.
Therefore, long-distance travel may go unfulfilled for certain underserved groups, disproportionately impacting some who already are of lower socioeconomic status.

The inequity in social capital stems from two reasons: the first is that individuals tend to have the majority of their ties within one socioeconomic level, and the second is that individuals most often create new associations with others that also have the same socioeconomic status, a phenomenon called homophily (Lin, 2001). Thus, the potential problem in limited access to long-distance travel is that some underserved groups may have less in-person contact with their ties and fewer chances to use those contacts to bridge to new ones even if they have adequate access to local destinations within their home community. This paper argues that individuals require face-to-face interaction for the purpose of building and maintaining strong social networks, which is a necessary part of overall and continued well-being. In fact, those with more spatially spread social networks may have lower “network capital” and a higher risk of social exclusion (Cass et al., 2005). The linkage between social capital and equity culminates with Lin’s “Social Resources Theory” (1999), which states that there is an interconnection between embedded resources in a network and the socioeconomic status that one secures. Lin asserts that the “convergence of social resources and social capital theories” has created a link to social networks where there is utility gained from being able to “mobilize” the resources; access to resources is examined as an integral part of that.

Telecommunications have become integral to the global society and interactions with those at distance. If communication by technological means were adequate to maintain social network tie strength, then having a more geographically spread network
of ties should not affect one’s risk for social exclusion. However, Urry (2002) points out that not only is travel a fundamental human right, but that increasing local mobility or use of technology for communication cannot substitute the act of long-distance travel. In his study he argues that “corporeal” travel can never effectively be replaced because of the human desire for physical proximity to others, places, and events, in addition to having unavoidable travel obligations such as for legal, social, economic, live, and place-based reasons — or things that are dictated by location.

**Well-being**

In the past hundred years, the standard for human interaction has changed significantly. The idea of locally based social circles stems from the early 1900’s in Europe and North America when face-to-face interaction was a staple of daily social life that was most often contained within a relatively small geographic area; since then there has been an increase in the spread of social networks (Larsen et al., 2006). While not all individuals may think of long-distance travel as a necessity for well-being, it certainly plays a role in how individuals maintain relationships with those they consider emotionally close, and how individuals choose to spend their limited time. In a study conducted in the San Francisco Bay Area on long-distance travel, 63 percent of people said that they were positive about long-distance travel, an affinity for which was higher than short distance travel (Mokhtarian & Salomon, 2001). This may suggest that the destinations or purposes behind longer-distance trips were more special or satisfying than ones that are shorter. It was also found that respondents preferred travel related to “recreation, entertainment, and social activities,” as opposed to for business purposes.
Travel by air was also preferred over vehicle travel. Finally, some respondents reported to like travel for the sake of traveling. When asked how much more one would like to travel, about 55 percent said that they wanted more travel, 35 percent wanted their travel to stay the same, and about 10 percent wanted less travel. While the study was looking to find out about travel for travel’s sake, the authors admit that it is likely that there is still some association with the destination of a trip when the questions were answered. Thus, when respondents reported that they wanted more travel, we might reasonably infer that some of them likely meant that they would prefer more trips, vacations, visits with friends and family, and the like.

The ability to do long-distance travel for the purpose of maintaining and building social networks from which one may access resources is wedded to the idea of well-being. While there is no definitive definition of well-being, it is measured from the perspective of the individual, and is loosely defined by “judging life positively and feeling good” (Veenhoven, 2008). As a field, subjective well-being considers more than just financial success, it focuses on three interconnected areas: “people’s emotional responses, domain satisfactions, and global judgments of life satisfaction” (Diener et al., 1999). Global satisfaction can be further broken down into categories which include areas such as “recreation, love, marriage, [and] friendship” (Diener et al., 1997). Thus, subjective well-being is not defined by any outside criteria, but rather varies by the individual’s own evaluation of their life satisfaction.

Veenhoven (2008) equates Jeremy Bentham’s definition of happiness to subjective well-being in that it is “the balance of pleasure over pain” (Burns, 2005).
Another study uses a quality of life definition that is similarly related to well-being, but is divided into objective and subjective categories, where the former are the “facilities and chances in one’s life” and the latter are the “sense of being advantaged so that the consequence is a sense of happiness” (Noghani et al., 2009). In the study of transportation equity, it may be important to study both the objective and subjective aspects of well-being for the sake of determining whether or not transportation policy goals accomplish what they set out to do as perceived by those they were intended to serve. For subjective well-being, it is up to the individual to evaluate if the presence or absence of long-distance travel accessibility in their life contributes to further opportunities that are a part of their happiness equation.

The concept of social exclusion can also be connected to subjective well-being since those who are excluded may feel lower levels of happiness. Here we may define social exclusion as a social disadvantage where uneven access to a means to do long-distance travel contributes to fewer chances to build or maintain social networks, a condition which may lead some individuals to rate their well-being as being lower than they would like. One study, while not necessarily examining long-distance travel, found that those at risk of social exclusion made fewer and shorter distance trips (Stanley et al., 2010). Thus, social exclusion is not a result of “lack of social opportunities but a lack of access to these opportunities” (Preston & Rajé, 2007).

In another study, those who were found to be at risk of social exclusion exhibited traits such as not feeling a strong sense of community, had lower incomes, and less mobility (Stanley et al., 2010). Those at risk also lacked regular contact with significant
others and had less contact with immediate and extended family members. At this point, we do not know whether those who felt socially excluded would require face-to-face, communicative contact, or a combination of the two to remedy this. While the concept of social exclusion will not be explicitly studied in this thesis, it remains one of the drivers behind the continued need for better data sources concerning unmet need for long-distance travel.

Concerning physical location, one study found that some relationships did not survive when key contacts moved; additionally, the study claims that certain pre-existing resources may be required to build social capital (Cattell, 2001). A supporting study argues that “social capital is not transferable,” (Coleman, 1990), which may be one reason why some in lower socio-economic status’ may have their social capital suffer when they are constrained by income and the high cost of most long-distance travel. Even more so, they have less ability to relocate themselves nearer to friends and relatives as there is sometimes reduced flexibility in housing, employment, and transportation options available to them. Furthermore, social capital was found to be related to well-being, specifically with coping ability, enjoyment of life, and feelings of hope — in other words, the belief that one controls their destiny, and that future events or other aspects of well-being are not predetermined (Cattell, 2001). Thus, it seems that one factor in well-being is an individual’s outlook on whether they personally possess the ability for success (by their definition) and grasp the opportunities that they desire. Still, one who is not extremely hopeful to begin with may be further discouraged when transportation options are difficult to utilize or very limited to that individual.
Prior research has suggested that opportunities for long-distance travel may be related to the formation and maintenance of social networks. One study found that participants lived an averaged distance of 500 kilometers away from people they classified as their “most important people” (Larsen et al., 2006). The authors note that this distance was not based on actual transportation networks so the distance to travel to them may actually be longer. Additionally, they met at the same frequency with those that lived 125 kilometers away as those living 400 kilometers away. Participants reported that they met with their “strong ties” (i.e. their “most important people”) at least once per year. Two factors found to be positive indicators of well-functioning social networks were the extent of social participation and communication (Karimzadeh et al., 2013); the former which we may argue requires some degree of long-distance travel in order to interact at events that are place-based. However, fulfilling obligations that require travel can be expensive and, in turn, exclude those without the financial means to participate or limit budget available for other needs.

Studies of obligatory social events demonstrate a connection to our automobile dominated transportation system in the United States. In a study where participants were interviewed about their long-distance travel habits, many provided examples of instances where they deemed travel as necessary, such as weddings and stag nights, and as a result, having a car was essential for making trips that only lasted two to three days (Larsen et al., 2007). Participants mentioned that having access to a car was the only way that made it possible for them to attend these obligatory events. Having a car gave them flexibility so that they did not have to miss work for an event, and it was often more economical
than air travel. Additionally, leisure travel (which may include visiting friends and family) was found to be much less income elastic than other trip purposes (Dargay & Clark, 2012), so while income increases, so does travel demand — however, for leisure travel in particular, people require this type of travel more than other types of travel, regardless of income level.

Although long-distance travel may be part of what is needed for overall well-being, it has been well-studied, and even less so in terms of equity. Thus far, it is unknown how much not participating in long-distance travel effects ones well-being, especially if one must forgo visiting with friends and family.

**The Inherent Value of Travel**

The concept that travel is a derived demand means that we travel as a means to participate in activities located at destinations, or different locations across space. Others alternatively argue that travel *is* the activity — that travel is undertaken for the sake of traveling (Mokhtarian & Salomon, 2001). Examples of this include driving scenic roads for the view, and walking and biking for exercise. Mokhtarian and Salomon (2001) argue that longer routes are taken sometimes because of the “variety-seeking” nature of humans. They continue by saying that part of the utility derived from travel may have to do with the other activities one can do while participating in travel, such as reading while riding on a train. The authors argue that humans have some degree of intrinsic desire to travel. Whether humans desire travel as an activity or as a means to go somewhere, this
does not change how the nation as a whole understands the demand behind long-distance travel. If travel is a derived demand, from a Neoclassical economic standpoint, one might say that low-income people demand less leisure travel because they do less travel, although the amount of travel might not be their choice. As leisure trips tend to become more expensive based on increased overnight stays and international and commercial air travel (LaMondia et al., 2014), this may be cutting down on social interaction gained since this type of travel is often paired with visiting friends and relatives.

Disadvantages in transportation access and social exclusion may be linked as a mismatch between available and affordable public or mass transportation and actual social needs (Currie et al., 2009). Demand for new types of transportation or extended services may not be apparent to policy makers and planners because the “customers” have been forced to adapt to their circumstances and current transportation data sources measures revealed or acted demand. For example, in rural northern New England, unmet travel need was found to be fairly uncommon because people living in this environment viewed car-ownership as a necessity (Kolodinsky et al., 2013). Forced-car-ownership (FCO) may also give the appearance that transportation needs are being met, while this high dependence on automobiles takes a toll on households as they are forced to spend about 50 percent of their household income on car-ownership (Currie et al., 2009). Due to the high percentage of household income spend on transportation, this may cause other types of trips or methods of transportation to become prohibitive to them and thus the activities at the destinations including those important for social network maintenance are missed.
This paper hypothesizes that long-distance travel contributes to SWB because it is the means through which one is able to visit certain friends and family to maintain and build social capital, as well as allowing one to experience different life opportunities, culture, and services not within one’s area of daily activity. Prior bodies of work suggest that social capital is strongly related to well-being, noting that social networks have value for the people in these networks (Helliwell & Putnam, 2004). As telecommunication may not always be adequate to maintain social networks, long-distance travel may be necessary, and therefore connected to SWB. The study also identified several predictors which are related to well-being, including: income, marital status, education level, and unemployment as a negative indicator. Frequent interaction with friends and family was also found to contribute to higher SWB. This finding corresponds to being part of a high-trust community which the authors found tended to increase overall health and therefore, SWB. In this study, community was defined mainly by geography (i.e. the region around one’s home location), but national and international community trust may require in-person contact facilitated by long-distance travel to be upheld.

It is also important to understand the assumptions behind why long-distance travel is necessary for some individuals to have a positive SWB. One of these reasons is being able to travel for the sake of travel, as this can be considered an act of expressing ones desires, freedom, and independence. Another assumption is that in-person contact with one’s most important or closest social ties is necessary for long-term maintenance of the relationship, and therefore one’s social network. One study concludes that SWB and daily travel are intertwined for three reasons: 1) there are positive and negative affects
which stem from the act of traveling, 2) travel enables one to engage in activities, and 3) the organizing of travel has implications for relieving or lessening stress in daily life (Ettema et al., 2010).” Another study had similar findings which concluded that performing activities outside the home had a positive effect on SWB (Bergstad et al., 2011). Although long-distance travel may be part of what is needed for overall well-being, few studies have ventured outside of examining daily or local travel. Thus far, it is unknown how much not participating in long-distance travel affects ones well-being, especially if one must forgo visiting with friends and family, or taking part in leisure. To understand the complex relationship between long-distance travel and SWB, it is necessary to use mixed methodology that includes in-depth interviews so as to not oversimplify.

Many of the methods previously used for analyzing well-being thus far have focused on questionnaires that only require simple answers. Bradburn’s Affect Balance Scale (Bradburn, 1969) is one questionnaire on well-being which contains two sections: a Positive Affect Scale and a Negative Affect Scale, each with five questions. The questions require yes or no answers which pertain to one’s current emotional state. It asks: “During the past few weeks did you ever feel: (1) … pleased about having accomplished something? (2) … on top of the world? (3) … particularly excited or interested in something? (4) … proud because someone complimented you on something you had done? And (5) … that things were going your way?” For the Negative Affect portion, it asks: “During the past few weeks did you ever feel: (1) … so restless that you couldn't sit long in a chair? (2) … very lonely or remote from other people? (3) … bored?
(4) … depressed or very unhappy? (5) … upset because someone criticized you?" A downside of these questions is that they only gather information on one’s current state of happiness (Perkinson et al., 1994). The Affectometer 2 questionnaire, another well-known and succinct analysis method, also contrasts positive and negative feelings to get a general sense of happiness (Kammann & Flett, 1983). This study created its survey based on the Bradburn method and concluded that “well-being scores are determined more by short-term states than long-term traits.” Because long-distance travel is often conducted on a yearly basis, it would not be adequate to use a method that is based on such a short time period, thus this claim by Kammann and Flett (1983) may not hold true. Studying long-distance travel in terms of well-being may be well-suited for the discipline because of the longer-term time scale of long-distance travel, a feature that fits nicely with Diener’s (1994) definition of SWB.

Summary

In short, based on prior literature one can hypothesize that unmet long-distance travel need is a key component in accessing opportunity and social interactions, and thus well-being. This paper seeks to document data on this relationship directly by interviewing women directly about intercity travel and its role in their lives.

Data

Recruitment

The data used in this study were collected using several different methods between February and April of 2017. 24 female participants were recruited from within Chittenden County, Vermont using Front Porch Forum (an email newsletter), paper flyers
which were posted at local non-profits, posting in the University of Vermont’s (UVM) Announcements and Events online newsletter, and direct emails to potential participants within the UVM Transportation Research Center network. Local non-profit partners included Vermont Works for Women in Winooski, Mercy Connections in Burlington, and the Champlain Valley Office of Economic Opportunity in Burlington. Participants who were directly contacted via email were chosen either randomly from lists of UVM staff or were suggested as potential participants by other colleagues at the University. UVM staff were targeted as a main source of participants due to ease of contact and because they were likely to have varied experiences, education levels, and incomes, when compared to UVM faculty. Of the 24 participants in the study, 11 were UVM staff employees, 2 were employees of the UVM Medical Center, and 3 were graduate students. The remaining 8 participants all worked at least a part-time job elsewhere.

During recruitment 7 participants joined via Front Porch Forum, 6 from the online newsletter, 8 by direct email contact, and 3 by word of mouth. A total of 47 potential study participants responded within the 3-month recruitment and study session period. The 24 women were chosen to participate in order to have a balance of lower and higher income women, due to time limitations for interviews, and budget constraints regarding participant compensation. Upon completion of the session, participants received a $25 grocery store gift card.

**Study Sessions**

As part of the study, participants were required to complete a single study session which was advertised as lasting approximately one hour. Each participant’s session ranged
from about 30 minutes to 1 hour. The sessions were conducted in a public space such as a café, either on or off UVM’s campus, or at a place that the participant requested, such as their home or workplace. Participants had the choice to meet at a more private location, such as an empty conference room, if they felt uncomfortable completing the study with others around. Due to the study objective regarding transportation disadvantage, every effort was made to meet participants where it was convenient for them and to minimize the travel they were required to do. The sessions were also scheduled so that participants could attend during their lunch hour or after business hours if needed. Each participant was scheduled for their own individual session which was one-on-one with the graduate student researcher. Consent for participation was implied when the participant showed up at their scheduled session. Additionally, they were informed before any data were collected that they could stop the interview or surveys and skip any questions at any time.

Each study session contained three parts in the following order:

1. A survey on social network geography titled “People and Travel Survey” (developed in partnership with collaborators, see Appendix A),
2. An in-depth, semi-structured interview (see Appendix B), and

Participants were untimed and were allowed to spend as much time as they needed on each section. They were also reassured that they could ask clarifying questions during
any portion of the session. All but one of the participants completed all portions of the data collection session.

Social Network Geography Survey

The social network geography survey was developed collaboratively by the UVM/Auburn University long-distance travel research group. It was an experimental survey aimed at approximating the geographic spread of one’s social network without requiring complete enumeration of one’s contacts, while also collecting relevant sociodemographic information. The participants in this study comprise only a quarter of the total sample for this survey and more complete results to the measurement of social network geography are reported elsewhere. The survey was divided into three sections in the following order: “People in Your Life,” “Travel Frequency,” and “About You.”

The “People in Your Life” section asked about a total of 13 contacts. The first 10 were person-based and are used in this paper. The section contained the following statements:

- Think about a family member you don’t live with (Note: This was asked three times.)
- Think about a person you would go to for work or professional advice.
- Think about a person you would go to for personal advice.
- Think about a good friend.
- Think of a childhood friend.
- Think about a person you wish you could spend more time with.
Think of a person for whom you feel an obligation to visit (Note: This was asked twice).

Each statement was paired with a series of questions asking when the last face-to-face contact was made with the designated person, whether or not telecommunication had been used with this person within the last month, and how close their relationship was on a scale of 10 (very close) to zero (not close at all). Finally, the city or town and state or county of residence was also requested for each contact. An undergraduate research assistant coded these locations in GIS and calculated the straight-line distance to each contact from the participant’s home based on home zip code.

The “Travel Frequency” section of the survey required filling in two tables. The first asked the participant to check approximately how often they make a trip to a destination more than a 2 hour drive from where they currently live for the purpose of visiting family or friends, for work, or for personal business such as for a medical appointment, banking, or other services. Table 1 presents the results of this travel frequency question.
Table 1. Frequency of trip destinations more than a 2 hour drive from current residence

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visiting family or friends</td>
<td>Never</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>Less than once per year</td>
<td>5</td>
<td>20.8</td>
</tr>
<tr>
<td></td>
<td>Once per year</td>
<td>15</td>
<td>62.5</td>
</tr>
<tr>
<td></td>
<td>Multiple times per year</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>Once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>More than once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>For work purposes</td>
<td>Never</td>
<td>9</td>
<td>37.5</td>
</tr>
<tr>
<td></td>
<td>Less than once per year</td>
<td>5</td>
<td>20.8</td>
</tr>
<tr>
<td></td>
<td>Once per year</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>Multiple times per year</td>
<td>4</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
<td>Once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>More than once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>For personal business purposes</td>
<td>Never</td>
<td>16</td>
<td>66.7</td>
</tr>
<tr>
<td></td>
<td>Less than once per year</td>
<td>5</td>
<td>20.8</td>
</tr>
<tr>
<td></td>
<td>Once per year</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Multiple times per year</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>More than once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

The second travel frequency table asked participants to check approximately how often they make trips for vacation or leisure, trips that include air travel, trips with no overnight stay that include air travel, trips with no overnight stay which include 2 or more hours of driving each way, and trips that include a destination outside of North America. Table 2 presents the results of this travel frequency question. A majority of respondents made leisure trips and used air travel a few times each year. Making trips with air travel or with at least a 2 hour drive each way with no overnight stay was uncommon. Additionally, most participants traveled outside North America less than once per year.
Table 2. Frequency of trips by type and distance

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trip for vacation or leisure</td>
<td>Never</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Less than once per year</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Once per year</td>
<td>5</td>
<td>20.8</td>
</tr>
<tr>
<td></td>
<td>Multiple times per year</td>
<td>13</td>
<td>54.2</td>
</tr>
<tr>
<td></td>
<td>Once per month</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>More than once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Trip includes air travel</td>
<td>Never</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Less than once per year</td>
<td>7</td>
<td>29.2</td>
</tr>
<tr>
<td></td>
<td>Once per year</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>Multiple times per year</td>
<td>10</td>
<td>41.7</td>
</tr>
<tr>
<td></td>
<td>Once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>More than once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Trip with no overnight stay that includes air travel</td>
<td>Never</td>
<td>20</td>
<td>83.3</td>
</tr>
<tr>
<td></td>
<td>Less than once per year</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Once per year</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Multiple times per year</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>More than once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Trip with no overnight stay and 2 hours or more of driving each way</td>
<td>Never</td>
<td>9</td>
<td>37.5</td>
</tr>
<tr>
<td></td>
<td>Less than once per year</td>
<td>9</td>
<td>37.5</td>
</tr>
<tr>
<td></td>
<td>Once per year</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>Multiple times per year</td>
<td>3</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>Once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>More than once per month</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td>Trip that includes a destination outside of North America</td>
<td>Never</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>Less than once per year</td>
<td>12</td>
<td>50.0</td>
</tr>
<tr>
<td></td>
<td>Once per year</td>
<td>5</td>
<td>20.8</td>
</tr>
<tr>
<td></td>
<td>Multiple times per year</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Once per month</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
The last survey section consisted of sociodemographic questions. Table 3 presents these variables with the exception of home zip code, which was also gathered. A majority of participants were highly educated having an associate’s degree or higher. Furthermore, a majority of respondents had moderate household incomes between $50,000 and $100,000. These are limitations to the study as the goal was to have a substantial portion of respondents who were lower income or had lower levels of education.
Table 3. Sociodemographic and household characteristics

<table>
<thead>
<tr>
<th>Categorical Variable</th>
<th>Response Category</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education level</td>
<td>High school/some high school</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Some college</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s or associate’s degree</td>
<td>12</td>
<td>50.0</td>
</tr>
<tr>
<td></td>
<td>Graduate or professional degree</td>
<td>8</td>
<td>33.3</td>
</tr>
<tr>
<td>Owns a cell phone</td>
<td>Yes</td>
<td>24</td>
<td>100.0</td>
</tr>
<tr>
<td>Income</td>
<td>Less than $15,000</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>$25,000 to $49,000</td>
<td>7</td>
<td>29.2</td>
</tr>
<tr>
<td></td>
<td>$50,000 to $99,999</td>
<td>8</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>$100,000 to $149,999</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>$150,000 to $199,999</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>$200,000 or greater</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>Prefer not to answer</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td>Workplace allows working from home or other locations</td>
<td>Yes, and I often work from home or other locations</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Yes, and I occasionally work from home or other locations</td>
<td>9</td>
<td>37.5</td>
</tr>
<tr>
<td></td>
<td>Yes, but I never work from other locations</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>12</td>
<td>50.0</td>
</tr>
<tr>
<td>Employment status</td>
<td>Full-time</td>
<td>19</td>
<td>79.2</td>
</tr>
<tr>
<td></td>
<td>Part-time</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Full-time student</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Retired</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Not currently employed</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Continuous Variable</td>
<td>Mean</td>
<td>Median</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>Age</td>
<td>43.5</td>
<td>48</td>
<td>11.9</td>
</tr>
<tr>
<td>Household vehicles</td>
<td>1.8</td>
<td>2</td>
<td>0.9</td>
</tr>
<tr>
<td>Household size</td>
<td>2.3</td>
<td>2</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Note: Response categories for employment status represent the respondents who answered “yes” to each category.
Semi-structured Interviews

Many who travel little or not at all may exclude themselves from participating in travel surveys because they may believe they do not fit the criteria as a respondent or do not have any valuable information to offer. Because of this, a potentially significant segment of the population is missed, largely including those who are considered vulnerable research populations who also tend to be travel disadvantaged. Pairing interviewing techniques with a questionnaire enables one to more fully understand a respondent’s perception about the world, traveling, whether or not they feel they are able to participate in it, and the reasons for this. The interview format allows for follow-up and clarifying questions, both necessary for making sure respondents answer within the scope of the research and that they interpret questions as intended – a safeguard not possible within surveys. The advertisements for this study specifically stated that participants were needed for the travel study “whether you travel or not.”

The interview questions were designed to be non-directional, an interview method which uses several different versions of questions or similar questions to elicit responses which are less biased than asking more direct or explicit questions (Flick, 2009). This style of interviewing contributes to a relaxed and conversational, non-confrontational setting necessary for more complete disclosure of travel habits and desires from the interviewee. The questions flow from least- to most-structured in an attempt to account for an interviewee’s personal bias, and are almost circular in nature in that they attempt to draw out a comprehensive response from the interviewee. Flick (2006) recommends using this method to “prevent the interviewer’s frame of reference
from being imposed on the interviewee’s viewpoint.” He also recommends that rather than posing direct questions that might limit or bias responses, to “encourage retrospective inspection” by revisiting questions for further response after the initial round. Though personal bias is an issue to some degree with most methods, these interview techniques are one protection against it. While there are certainly limitations to performing interviews, there is reason for using both methods as an auxiliary technique to create richness in respondents’ stories not possible with just questionnaires.

Though interviews are not particularly suited to making generalizations as quantitative data enables (often due to small sample size), they complement quantitative data in supporting theory by “recognizing that underlying structures are complex and may be different from the observable events and discourses to which they have given rise (Winchester, 1996).” Here the value of interviewing stems from its ability to decode the complexity of travel in one’s life. In addition, interviewing also holds some advantages as a method for qualitative data collection in this study. While the interview questions do not necessarily cover sensitive topics, the one-on-one format of the interviews helped to gather more truthful responses than a focus group might, where participants can compare themselves to one another and may therefore embellish their responses.

Interviews with participants were audio-recorded with permission. The interview portion sought to first have the interviewee define travel in their own terms and discuss what it meant to them. Interviewees were asked about trips they took for different purposes, their trip making decisions, and the difference between trips they felt they wanted to take and trips they felt they needed to take.
The interview was broken into four themed sections. The first section was conversational so that the interviewee would feel comfortable sharing their thoughts and experiences. The first few questions of this section were intentionally made to appear very general. No definitions or guidelines were suggested for answering any of these questions. Interviewees were asked to share their answers based on their own understanding of the questions. The first question was, “When someone talks about traveling, what comes to mind for you?” Most interviewees brainstormed multiple answers for this. Next, the participant was asked to give an example of a trip they felt they needed to take and one that they wanted to take. Following that, they were asked to talk about what the difference was between the two types of trips. If a participant did not begin by talking about long-distance travel, a follow-up question asked them to talk about the distinction. However, all but two participants immediately began talking about longer-distance travel at the start of the interview.

The second section was meant to differentiate work, personal, and leisure or pleasure trips. Participants were asked how often they wanted to take leisure trips and to where. They were also asked to talk about whether they traveled for work and how those trips affected their personal or leisure trips. If a participant did not have to do work travel, they were asked about previous jobs or whether hypothetically they would like to and why.

The third section focused on the factors that affect how frequently one makes trips. Participants were specifically asked if the frequency of their trip making contributed to either a negative or positive impact on their life, or had no impact at all.
Next, interviewees were asked about what affects their own trip satisfaction. Finally, questions were posed about how access to vehicle and air travel affect their life and consequently, how the cost did.

The final section was used to wrap up the interview and give the interviewee the chance to revisit or follow-up on any questions. Participants were also asked if they had comments or questions for the interviewer, although they were also encouraged to speak up throughout the study session if they had any.

**Overall Well-being Survey**

The study of well-being, quality of life, and happiness has a long history and has been studied extensively under many different lenses. Consequently, these topics have been used for analysis in an array of disciplines including economics, psychology, and health sciences. Because the terms are often used interchangeably, a definition put forth by Diener (1994) has been employed in this study which reads, “Subjective well-being (SWB) . . . comprises peoples’ longer-term levels of pleasant affect, lack of unpleasant affect, and life satisfaction.” These things are considered using a global perspective concerning overall life matters rather than a local perspective which would focus on a single domain in one’s life (e.g. work, school). The global perspective may include things such as opportunities available to an individual, life situations, and personal outlook on life. The study takes this perspective in order to determine whether or not long-distance travel contributes to *overall* SWB while avoiding the biasing of responses that may place too much or too little significance on being able to travel or not. In other
words, how does the ability to participate in long-distance travel affect one’s life, for better or worse, if it indeed does have an effect?

As such, following each interview a brief post-interview survey was administered which consisted of two parts: the Satisfaction with Life Scale subjective well-being measure developed by psychologist Ed Diener (Diener, 1994), and a final question regarding well-being and travel. The Satisfaction with Life Scale score is calculated by adding up the rating assigned to each of the 5 statements and attempts to gauge one’s overall satisfaction with life, interpreted here as a proxy for overall well-being. The range of possible scores is from 5 to 35, with each statement being assigned a rating of 1 for strongly disagree to 7 for strongly agree. The five statements presented are the following:

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

The overall score is divided into 7 groups which represent different levels of life satisfaction:

- 31-35 Extremely Satisfied
- 26-30 Satisfied
- 21-25 Slightly Satisfied
- 20 Neutral
- 15-19 Slightly Dissatisfied
- 10-14 Dissatisfied
- 5-9 Extremely Dissatisfied

23 participants completed the Satisfaction with Life Scale. The mean score was 27 out of 35 and the scores ranged from 13 to 35 with 35 being the highest possible score for being the most satisfied in life.

**Results**

Results are divided into two sections. The first section delineates the general trends found in the surveys concerning well-being and social network geography. The second part is broken into subsections which include interview quotes that represent the findings of the qualitative portion.

**Social Network Geography Survey Results**

Table 4 tabulates measures of social network and travel for study participants (n=22), who completed both of the quantitative data collection sections, by their SWLS Score from most dissatisfied to most satisfied. A general finding here is that those who are more dissatisfied in life travel for vacation and leisure or to see friends and family less frequently than those who have higher SWLS Scores.
Table 4. Study Participant Satisfaction, Social Network Size and Travel

<table>
<thead>
<tr>
<th>ID</th>
<th>SWLS Score</th>
<th>Ave. Distance (mi.) to Contacts with Closeness ≥ 7</th>
<th>Income</th>
<th>Travel Frequency: Vacation and Leisure</th>
<th>Travel Frequency: Friends and Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>13 (dissatisfied)</td>
<td>693</td>
<td>Low</td>
<td>Less than once per year</td>
<td>Less than once per year</td>
</tr>
<tr>
<td>13</td>
<td>14 (dissatisfied)</td>
<td>476</td>
<td>Low</td>
<td>Once per year</td>
<td>Less than once per year</td>
</tr>
<tr>
<td>1</td>
<td>19 (slightly dissatisfied)</td>
<td>1665</td>
<td>N/A</td>
<td>Once per year</td>
<td>Never</td>
</tr>
<tr>
<td>3</td>
<td>15 (slightly dissatisfied)</td>
<td>4</td>
<td>Middle</td>
<td>Less than once per year</td>
<td>Less than once per year</td>
</tr>
<tr>
<td>6</td>
<td>23 (slightly satisfied)</td>
<td>163</td>
<td>Middle</td>
<td>Multiple times per year</td>
<td>Multiple times per year</td>
</tr>
<tr>
<td>19</td>
<td>23 (slightly satisfied)</td>
<td>62</td>
<td>High</td>
<td>Multiple times per year</td>
<td>Multiple times per year</td>
</tr>
<tr>
<td>23</td>
<td>22 (slightly satisfied)</td>
<td>1476</td>
<td>Low</td>
<td>Multiple times per year</td>
<td>Multiple times per year</td>
</tr>
<tr>
<td>5</td>
<td>27 (satisfied)</td>
<td>347</td>
<td>Low</td>
<td>Once per year</td>
<td>Multiple times per year</td>
</tr>
<tr>
<td>12</td>
<td>27 (satisfied)</td>
<td>690</td>
<td>Low</td>
<td>Once per year</td>
<td>Multiple times per year</td>
</tr>
<tr>
<td>15</td>
<td>26 (satisfied)</td>
<td>275</td>
<td>Middle</td>
<td>Once per year</td>
<td>Less than once per year</td>
</tr>
<tr>
<td>16</td>
<td>29 (satisfied)</td>
<td>58</td>
<td>Middle</td>
<td>Multiple times per year</td>
<td>Multiple times per year</td>
</tr>
<tr>
<td>21</td>
<td>29 (satisfied)</td>
<td>617</td>
<td>High</td>
<td>Multiple times per year</td>
<td>Multiple times per year</td>
</tr>
<tr>
<td>2</td>
<td>31 (extremely satisfied)</td>
<td>489</td>
<td>Low</td>
<td>Multiple times per year</td>
<td>Multiple times per year</td>
</tr>
<tr>
<td>4</td>
<td>32 (extremely satisfied)</td>
<td>448</td>
<td>High</td>
<td>Multiple times per year</td>
<td>Less than once per year</td>
</tr>
<tr>
<td>7</td>
<td>33 (extremely satisfied)</td>
<td>384</td>
<td>Middle</td>
<td>Multiple times per year</td>
<td>Once per month</td>
</tr>
<tr>
<td>No.</td>
<td>Satisfaction Level</td>
<td>SWLS Score</td>
<td>Overall Emotional Closeness</td>
<td>Distance from Home Location</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-------------------</td>
<td>------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Extremely Satisfied</td>
<td>31</td>
<td>Middle</td>
<td>Multiple times per year</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Extremely Satisfied</td>
<td>34</td>
<td>Middle</td>
<td>Multiple times per year</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Extremely Satisfied</td>
<td>34</td>
<td>Middle</td>
<td>Multiple times per year</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Extremely Satisfied</td>
<td>31</td>
<td>Low</td>
<td>Once per year</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Extremely Satisfied</td>
<td>32</td>
<td>High</td>
<td>Once per month</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Extremely Satisfied</td>
<td>32</td>
<td>High</td>
<td>Once per month</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Extremely Satisfied</td>
<td>35</td>
<td>High</td>
<td>Multiple times per year</td>
<td></td>
</tr>
</tbody>
</table>

In general, those with a higher satisfaction with life score (SWLS) traveled more frequently to visit family and friends who were at least a 2 hour drive away in each direction (Figure 1). Similarly, those who had a higher SWLS Score also traveled more frequently for vacation or leisure type trips (Figure 2). A scatterplot (Figure 3) depicting overall emotional closeness of contacts (on a scale from 0 to 10) and distance (in miles) from one’s home location shows that a majority of contacts are closer to home as one might expect. However, there is a grouping of emotionally closer contacts that are further from home for some participants. A majority of social network contacts (75%) are located within 500 miles of one’s home location.
Figure 1. “Satisfaction with Life Score” by Frequency of Travel to Friends and Family

Figure 2. “Satisfaction with Life Score” by Frequency of Vacation or Leisure Trips
There does not seem to be a pattern when considering the relation between SWLS Score, the average distance from strong contacts, and income (Figure 4). There are both people with smaller social networks, low income, and high levels of life satisfaction, as well as those with moderate income and lower levels of life satisfaction. It is difficult to make conclusive statements about causal relationships within these trends with such a small sample size but also because there are many confounding factors at play for different individuals. Thus, interviews were used to gain further understanding of the patterns and general themes for which the quantitative data could not provide clear answers.
In order to understand the quantity and complexity of the information provided in the interviews, a series of 12 themes were identified and are organized here by research question: 

1. How does the ability to participate in long-distance travel affect well-being?
   a. Value of Face-to-Face Time
   b. Breaking from the Routine
   c. Adventure and Experience Trips
   d. Medical Services Trips

---

1 Within quotes in this section places and names were changed when associated with family members only if there was a possibility of the connection revealing identity.
e. Travel Envy

2. Is the extent of one’s social network geography related to travel and travel needs?
   a. Personal Obligations
   b. Family Heritage
   c. Travel Party and Place Loyalty

3. What are the barriers to accessing long-distance travel?
   a. Financial
   b. Employment
   c. Household
   d. Emotional

The 12 themes are organized by the research question with which they most closely fit.

**How does the ability to participate in long-distance travel affect well-being?**

Four of the five themes in this section relate to the types of trips or the reasons why people travel. All might be considered components of well-being: friends, family, breaks, adventure, and services. The last section describes the social status that ability to travel encompasses and speaks to the envy on the part of those who cannot travel to meet these goals.

**Value of Face-to-Face Time**

The geographic dispersion of a participant’s social network often determined at least a portion of the destinations that participants visited in part due to the value they place on face-to-face time with loved ones and friends. Though most participants preferred a
combination of leisure vacations and visiting friends and family, most often visiting family took precedence when deciding which trips to pursue.

“I mean if I could never go on a trip again, a leisure trip again, I'd be OK with that but it would be sad not to see my sister again.” (No. 10)

Other participants explained that the location of the destination is less important than who they were going to see.

“If your destination is to go see a particular place then it's really important, but if your destination is to go see friends then the destination itself doesn't matter, it's seeing the friends that matters at the end. So then the destination wouldn't be that important, they could kind of be in anywhere and I wouldn't really care.” (No. 12)

Another participant felt similarly.

“I wouldn't be excited to travel to Nebraska, but if I was meeting someone I loved there, much better.” (No. 13)

Several participants talked about the regularity with which they visited relatives.

“I travel probably to see my family once a month or so and they're out of state so that's important to me in terms of being there for their birthdays and just to keep catching up. And friends as well. I have a lot of friends in the Massachusetts area, so I'm making that trek a lot.” (No. 7)

Another participant explained that although she dislikes travel for reasons such as the inconveniences and discomfort of it, she continues to do so as she feels she needs to see her family often.

“If you don't have family in the area, if you want to see people . . . my goal is to
see each one of my kids every other month, so that's twelve trips right there, I have two kids, and they aren't here.” (No. 24)

Additionally, life events and holidays were common reasons to travel to see family.

“[I travel] several times a year, it really depends. Definitely for holidays, so for like Christmas and New Year’s I'll go home. I'm going home for my mom's birthday in March. Over the summer my birthday. Probably about four or five times a year if I can.” (No. 14)

While most participants talked about keeping in touch with friends and family members using various forms of telecommunication, when compared to in-person communication, there was no competition.

“You get together and then more family members show up and then you all get together and talk and you tend to open up more in person. It's pretty superficial when you're on any other form: phone, email, versus being in person.” (No. 17)

One participant talked about how physically being present was important for some of her relationships.

“Well [my grandson] likes to do things. We like to cuddle and he likes to read stories and you can do some of that [using video chat] but then he's so distracted by other things in his environment whereas when I'm there, I can be silly and tickle him, and then the dog, he loves our dog. So it's exhausting and I get sick every time I see them . . . but it's always emotionally really rewarding.” (No. 24)

Another participant described how telecommunication “feels” different than in-person contact.
“I don't think [telecommunications] would replace the visit, I think it would be sufficient . . . it's better than nothing, but I also am very bad at keeping in touch with people like that. I hate calling people, and I know especially for older people it's preferred but it's not something I'm good at. But even then I think there's a lack of intimacy or connection when you're separated from someone by a computer or only communicating via text. There's a lot to be said for being in the same room with someone and feeling their energy and hearing their voice without digital garbled skype problems.” (No. 13)

One participant talked about how she combines leisure trips and trips to see family since her family is geographically dispersed.

“We have so many family members that are in different parts of the country so we try to combine the vacation and visiting family. [. . . ] My husband's family is mostly in [states in the DC area] and he has some in [Europe] . . . my side is [west coast], [New England], and [the South].” (No. 21)

Others talked about family being across the country but not being able to visit for various reasons.

“Well we do have some relatives that are in [the South] and New York but we've never been to [the South] to see them and we rarely go to New York. And I do have some cousins in Texas that I'd like to visit but I've never been there either. But it is important that you can travel if you have to.” (No. 3)
The incredible importance placed on face-to-face interactions suggests that if family and friends are at a distance they must use long-distance travel to achieve this quality time which in turn will affect well-being. One participant was very direct in expressing this.

“I think if I don't take trips, [. . .] I guess I do get kind of restless so I think it does benefit my mental health to be around friends from home or friends from college.

I think it helps me re-center and puts me in a better state of mind.” (No. 2)

**Breaking from the Routine**

Most participants felt that traveling for various reasons impacted their overall well-being. During the interviews respondents were asked to talk about the effect that travel had on their lives, whether it contributed positively or negatively to their well-being or had no affect at all. As described above, many brought up their desire to be with friends or family who did not live nearby but many also discussed the need for a break from the routine as a component of well-being as outlined below.

“If I can't take a trip I start to get antsy and I want to go somewhere. But that's about it. It doesn't affect [my well-being in] any other way except that I get eager to go.” (No. 10)

This participant was then asked how her life would be affected if she had to decrease the amount of travel that she currently did.

“It would be disappointing, first of all, not to go visit my cousins. So then I would definitely get a little more depressed if I couldn't see them.” (No. 10)

Other participants felt taking trips was necessary as a reprieve from work life or other events that could be stressful or monotonous.
“I think [travel is] pretty important because it adds some adventure to my life I wouldn't have if I just stayed in one place. And it helps keep me going . . . otherwise I get burnt out just working in a boring desk job. So it's nice to have a destination to look forward to. [. . .] My job fits that description. I just sit in an office all day and stare at a screen. Sometimes I get to talk to students and that's it.” (No. 23)

This same participant described travel as having a certain “escapism” to it. Many participants described their jobs in the same way, needing to get away in order to feel more balanced in life.

“I think you can get kind of sick just being in your day-to-day, like groundhog day, you wake up in the same place every day, and see the same things, so it's good to just be in a totally different environment and kind of come back refreshed and like, oh, yeah, I like this here.” (No. 12)

Some participants talked more generally about using travel to take a break from their routine activities.

“[I travel] to get out of my own life and work and take a break from things and especially if it's a family trip, just to spend time with my family that isn't just focused on what we have to do in our daily lives.” (No. 19)

Overall, it was a common theme to want to escape from work for a while.

“Work for me is pretty stressful and I like to be able to take sort of extended breaks from my work. I feel like I get way more recharge from actually taking a week or two off and being gone and sort of out of sight, out of mind. It's hard to
fully disconnect from work if you're in the same zip code. And so being in a
different country where your cell phone is off and they can't reach you I feel like
is really important to my sanity.” (No.22)

This same participant continued to explain that the stress and demands from work can be
dealt with better when there is an impending vacation.

“I feel like work gets easier when you have an end point coming up . . . it just
makes it way more tolerable, and then coming back and feeling energized when
you come back. So travel in general has always been a really positive thing in my
life and I feel really lucky for that, I feel really fortunate that that's the case for me
and that I feel really comfortable traveling.” (No. 22)

While many participants mentioned that they think they should be taking breaks, this
often was just not possible. One woman who worked night shifts was often not able to
find a coworker to cover her shift if she wanted time off. She explained that she thought
her life was negatively impacted by not traveling.

“I mean I think you know you need to take a break and there is definitely more
burnout, more tired, more everything, if you're not taking something. [. . .] I think
that there is the potential for less general stress. You know, just be able to get
away and do something different. Different scenery or something that's not
focused on work. I just haven't figured out my remedy yet.” (No. 8)

One woman working as a licensed mental health professional also spoke about how she
felt that vacations were necessary.

“Oh, I think I would do myself a big favor if I took more than, you know, five
days a year or 6 days a year, I think I would do myself a great benefit if I took more vacation.” (No. 15)

This woman noted that it would be very good for her “psyche” to take more vacation time as she did not consider “staycations” adequate alternatives to going somewhere farther away. When asked how she thought her life would improve by taking more time off she replied with several ways.

“I'd be more curious, I'd be more energized, I'd learn more about other states, other cultures, I would get out of the cold in the winter periodically, which would be good, I would challenge myself to get out of my comfort zone some, I'd meet new people, I'd probably try new foods, see great art, I don't know, swim with dolphins?” (No. 15)

Even when participants loved their jobs and were able to see family or friends who lived locally often, going to destinations away from home seemed to be a key ingredient in a fulfilling life.

“[Travel] definitely has a positive impact. I think the more vacations we take, or even if they're just weekend trips, we're definitely feeling more positive and having a better outlook and having just more fun.” (No. 16)

When this participant was asked if she thought she could have just as much fun staying around her home town, she replied by saying that she did not think she would.

“I think we do stuff on a daily basis to have fun and enjoy life, but it just feels that much more enjoyable to get out and do something new and different that's not in our backyard.” (No. 16)
Many of the participants’ responses stressed their need for periodic breaks, if not for a long weekend, then for a longer vacation. These trips were necessary for participants to feel re-energized in their daily lives. The next section focuses on the theme of adventure and experience trips, a type of trip that was often talked about in conjunction to one’s need for a break from their routine.

**Adventure and Experience Trips**

Many participants, whether or not they were experienced or avid long-distance travelers, expressed that they desired to take trips merely for the experience of doing so. When asked about where one would go without limitations, participants were almost always readily able to list off destinations they were interested in visiting. These were trips that had pleasing aesthetics, educational or cultural value, and were almost always solely for leisure, whether with family, friends, or a spouse.

“I would say in college and in graduate school I traveled a lot outside of the country to Central America and South America and that has shaped who I am as a person and what my goals are and it’s also something that I just really enjoy, immersing myself in a whole different culture and learning new languages and eating new foods and stuff like that. […] I think my perspective changed because of it.” (No. 2)

Several participants talked about their desire to experience a different lifestyle and to get out of their daily routine.

“I think [travel is] really important so you can learn different cultures or you can see different places [because] we live in a small state.” (No. 4)
Another participant had a similar sentiment.

“I really enjoy going on trips and just seeing other parts of the world or how people live.” (No. 14)

Even without extensive previous travel experiences, most participants seemed to have a sense of what it might be like or at least had aspirations to participate.

“I grew up in a small town and my family could never travel. We took one vacation my whole life growing up so now that I'm able to do it a little bit more, I like to be able to travel. So I think it's also important to see places beyond what you're used to, and to see more if you can.” (No. 6)

Several participants also decided that a particular location was not necessary, as long as they were somewhere that was new to them or doing something other than their normal routine.

“Yeah, [I] mostly [travel] just to get out of the routine. And just mix it up. Wake up in a different place, eat different food, see different people.” (No. 11)

Some respondents felt very strongly that having new experiences required traveling to destinations that were not nearby.

“[Travel] is important to my life . . . mostly [for] variety. I get bored being in the same place all the time. I like to see different places, see friends who don't live close by, see things that aren't [nearby] . . . expand your mind.” (No. 12)

Even one self-proclaimed “non-traveler” had a couple places she wanted to go in her lifetime.
“Oh! I would like to go to Portland, Oregon because they have tiny home villages there and my dream is to have a tiny house on wheels.” (No. 3)

Throughout, these sections of the interviews, it was clear that technology, whether television, radio, Internet, or telecommunications had created travel objectives or dreams for people in what Urry (2002) refers to as virtual travel. Many participants also desired travel based on what they saw their peers doing or talking about.

Medical Services Trips

Most often the trips that participants would classify as personal trips were the ones where it was necessary to run an errand or attend a medical appointment. For some people these were regular trips that had an expiration date, and for others they were annual appointments or special cases. Being able to fulfill personal needs that may only be available at a distance is an important part of personal long-distance travel that should not be considered “leisure.”

“Just recently this past fall I traveled to Boston once or twice a week for my daughter to have physical therapy just because we didn't have anyone who specialized in what she needed here. Living in such a sparsely populated area I think travel is even more important.” (No. 4)

Another participant decided to continue seeing the same doctor that she had used before attending college. However, three years after graduating she was still commuting to Massachusetts for all of her visits.

“In the past year I have [traveled] for doctors’ appointments but I just switched doctors up here so I wouldn't have to [travel]. (No. 5)
Most participants did not want to travel far for these types of trips. One person decided to receive treatment for medical condition closer to home, although they had to drive to out-of-state to receive a diagnosis.

“A couple years ago I had to go to Dartmouth Hitchcock to go to get a proper diagnosis cause I couldn't get it up here. So that became an all-day affair. That was brutal.” (No. 8)

While the out-of-state doctor offered to treat this participant, driving limitations affected a decision to seek more proximate care.

“It would have taken me 8 hours I think to get to Dartmouth Hitchcock if I couldn't go on the interstate. So how the hell do you do this if you can only go when the weather is clear? So I opted to try and find another doctor. I mean, I've gotten lucky that I can get my needs met without having to leave the county.”

(No. 8)

**Travel Envy**

While the interviews were constructed in a fashion so as to not place any expectation on the interviewee, many respondents seemed tense when talking about travel. The word *travel* holds different meanings for different people. For some, it was a positive and enjoyable thing to talk about, but others seemed concerned with portraying their travel habits in the right light in order to make themselves seem more like world travelers, as wealthier than they actually were, or to suite another stigma associated with traveling longer distances for things such as leisure travel.
“A friend of mine [and family] . . . last year they went to [a ski resort out West], I literally got a pain in my chest when I heard that.” (No. 9)

This participant went on to explain that her and her husband met at a ski resort out West, thus it is a special place for both of them and somewhere that they do not often get to revisit. When asked about what travel meant to her she responded with concerns about the expense and continued to comment on her friend’s trip.

“The desire [is there] to travel regardless of our budget. Travel is something I don't want to give up. No matter what our financial status is. [I feel] jealousy when they’re going [out West] to ski. I kid you not.” (No. 9)

Participants who worked in administrative positions also mentioned their jealousy when coordinating trips for faculty or professors going to conferences or work-related events. They recognized the opportunity of “piggy-backing” personal or leisure type trips onto either the front or back end of work-related trips.

“Well for me, my family lives [thousands of miles away] so I only go there once a year right now . . . because I'm the one paying for it. With faculty for conferences their grants pay for it, you know, nothing comes out of their pocket. So they still get to enjoy [big metropolitan regions] or wherever it is that they're going.” (No. 1)

Another participant cited her profession as something that has exposed her to travel and affected her decisions surrounding it.
“[I] help students apply for awards like the Fulbright [Fellowship] and Rhode’s [Scholarship]. So they're all going to be going places, which I think makes me want to go somewhere even more.” (No. 23)

Is the extent of one’s social network geography related to travel and travel needs?

While no respondents would necessarily relate to the term of meaning of social network geography, they did talk about related themes often including the value of face-to-face time with the loved ones already discussed above. But they also mentioned obligations, heritage and group loyalty to places. Although these not all necessarily positive contributions to quality of life they do speak to additional aspects of social network geography.

**Personal Obligations**

During the interviews there were many situations where participants reported feeling obligated to travel, whether it was to see certain contacts or to be present during a certain holiday or event. For many participants, visiting people, especially older relatives, was important in checking up on them, although sometimes the trips were unenjoyable or burdensome.

“[I’m] not seeing my family more than once a year. Seeing them more often would make me feel better about what's going on instead of just relying on what they're telling me. They're not gonna be around forever, and again, seeing is better than just hearing them on the phone. Cause my mother will tell me certain things and then I'll talk to my brother and he'll say no she's totally fine.” (No. 1)

Another participant spoke about how visiting her parents and those of her partner was not
enjoyable but was something that had to be done.

“It's really out of necessity. [. . .] Those trips are more of an obligation. The places that I go are not places that I would necessarily go if I wasn't going to visit family. And they're not relaxing.” (No.11)

This participant added that she would visit for as short a time as possible, spending only one day with each parent. While she talked about not enjoying her visits, she did feel some gravity about the situation and her reasons for paying a visit.

“Cause they're old and they're gonna die soon. And it makes them happy.” (No. 11)

Another participant talked about an obligation trip in a more positive manner.

“I . . . go see my grandma; I mean I want to do it but I feel like I do it for her cause I know it's a thrill for her to see her grandkids.” (No. 23)

Even with strained relationships many participants felt that they would one day have to increase their trips to parents and other relatives because of their age as they felt it would become their responsibility to care for and make decisions for them.

“I've traveled home before because [my parents] wanted to see me, which because of the state of our relationship, I would possibly list as an obligation. It's not always enjoyable for me, but I am keenly aware with them that I may have to take those trips to take care of them.” (No. 13)

Other participants cited obligation trips as anything that was not solely for their personal enjoyment or what many would classify as a leisure vacation. One woman talked about how she felt obligated to go with her husband to visit his friends across the country.
“I would say yeah, that's more of an obligation. I mean, they live in [the West] so it's definitely gonna be a good trip, but it kind of got pushed ahead of an Aruba trip because we felt an obligation to go visit them.” (No. 16)

A medical student mentioned that despite not having the best relationship for her parents, she felt that her family expected her to come back for holidays like Christmas and are disappointed when she does not go home for Thanksgiving.

“My brother is eleven years old and I feel more of an obligation to see him because he's growing up and I don't want to miss him growing up. And I also feel an obligation to go see my parents because they've done so much for me. We don't always get along so I think our relationship is actually better sometimes when I'm at a distance and only talk to them on the phone and via text. But I try to see them probably every [year], at least twice a year.” (No. 2)

Another participant’s friends and family also expected her to visit them in Massachusetts. With Vermont seeming remote to non-Vermonters, many perceive the state as being too far to travel to, or at least too inconvenient.

“I feel obligated to go home and visit my friends and family. [...] I just feel like otherwise I wouldn't see them if I were not to travel down there. A lot of my friends don't want to come up because they say it's too far. And I feel like when I go home to visit my parents all my friends expect me to see them as well because I'm already down there which isn't always easy because I'm not down there for an extended period of time usually. [...] I want to see them but also it would put a strain on our relationship if I didn't go down there.” (No. 5)
Several participants explained that even joyful occasions can feel like an obligation.

“Going to friends’ weddings, I definitely want to, but also feel an obligation.”

(No. 7)

One woman interviewed has been to many weddings in the past few years, as she explained that she was at the age where all of her friends were starting to get married.

“I mean of course I love going and seeing friends and going to weddings and celebrating with them . . . but that's more of an example of a ‘need’ type of trip. [. . .] It's more prescribed, like I don't have a choice of where I'm going and when I'm going.” (No. 22)

**Family Heritage**

A respondent’s heritage or ancestry was one reason for certain trips being on a bucket list or wish list. Some respondents talked about trips they planned or hoped to go on based on this.

“My husband and I are definitely planning a trip to [two countries in Northern Europe] because both of our families are from Scandinavian countries. [. . .] My family's from [one country] and my husband's family is from [the other] so we wanted to make it as one trip.” (No. 21)

This participant had previously traveled throughout several different European countries and was a frequent traveler. When asked if she would be visiting relatives she replied that it was more of a trip to explore the countries of her and her husband’s ancestry.

“I did have family there and I think most of them have passed away, so it's just coming back to see where everyone lived and then in Sweden my husband still
has a couple of cousins over there. So yes, reconnect with them.” (No. 21) Another participant also cited places she wanted to go because of her ancestry, however, with less certainty in fulfilling these trips.

“I would like to get to Greece. I have family, and it's not [under] a common name, but I have family in Greece, and probably in Turkey, and still in Italy and Israel. Could it be kind of neat to maybe find some of these family? Yeah, maybe. I liked Italy, I like food, and the architecture was incredible, and so there's things I would like to see in some of those places.” (No. 8)

This participant’s mother had taken her to Italy once in 1995, although she has not been back since for a variety of reasons, the fact that she cannot request time off more than two months in advance at her current job, and because she does not have a partner to go traveling with.

**Travel Party and Place Loyalty**

Taking trips with family and friends to places other than where they reside was also discussed by some respondents. These trip locations are ones that were visited regularly, sometimes on an annual basis, and most often with the same group of people each time.

“We go to . . . Maine almost every summer and we camp there with some family. So we kind of build that in as an annual event so we definitely appreciate going back there even though we've been before.” (No. 16)

This participant continued by saying that they go for two to three days around the same time each year after the 4th of July and have been going for the past 12 years. Another respondent also participates in a yearly trip.
“[My husband] likes for example [to] go camping every single year to . . . New York and I would like to go to other [places] like maybe Maine or Cape Cod or something like that. I wouldn't say that I'm dissatisfied camping there cause we're with family but I would just like to be somewhere else.” (No. 10)

**What are the barriers to accessing long-distance travel?**

During the interviews participants were asked to list and discuss the things that prevented them from traveling when they wanted to. Some of these are barriers to many activities in life whereas others relate specifically to travel. The following sections group the interview results into different categories of barriers which include financial, household or family-related, employment, and emotional barriers.

**Financial**

Money-related barriers were prevalent throughout the interviews. The discussion of travel to visit loved ones or once-in-a-lifetime destinations was quite often paired with the disappointment in just how expensive or prohibitive long-distance travel can be.

“I have debt from traveling and a little bit of student loan debt. Yeah, and sometimes instead of paying that off aggressively I just go on another big trip, which sets me back, but also sustains me.” (No. 23)

Another participant made remarks about all of the other various financial responsibilities she had to put before traveling for pleasure.

“Well, the last 10 years it's been more of a financial thing because I moved here, bought a house, all that kind of stuff. And I had to get settled, had to make repairs
on the house. [. . .] So I really haven't done any vacation type traveling other than just when I do go I see my family.” (No. 1)

Another participant also talked about her inability to visit family due to the cost of airfare and the expenses she would incur once at her destination, which she estimated at about $1,000 per visit. This participant went on to say that she only gets to visit her son on the west coast about once a year because of this and the last time she saw him in person was over a year ago.

“The [trip] I want to take I can't do too often because it's too far away and costs too much. [. . .] The [trip] I want to take I'd like to do every two months cause it's visiting my son and my new grandchild.” (No. 17)

However prohibitive cost was, most participants talked about their desire to still travel. A different participant explained that it was worth it to make the nine hour drive to an airport in Cleveland, Ohio in order to pay a lower fare.

“It's part of the budget. I won't get my hair cut and I will buy clothes from thrift stores and do other things to save money but I will not, not travel.” (No. 9)

**Household/Family**

Household and family-related barriers were present throughout the interviews. For participants who had serious partners, participating in long-distance travel also became more complicated due to having to coordinate schedules and other factors.

“Uh, [travel] would be difficult I think with my ten-year-old and getting her to school and back because there's no bussing and with the schedule, my husband's schedule and mine are not the same, so he could pick her up but I would have to
drop her off and it just, it would be hard to travel.” (No. 3)

Committed partners also often had different opinions on which major expenses should take priority.

“I don't have anything planned. I think a big part of this is I want to go on vacation with [my boyfriend] and he's trying to build a house right now so he's trying to save money. [. . .] I don't think vacation is a priority for him just because he has vacationed a lot in the past.” (No. 5)

Many participants felt obligated to cater to their pets, whether young or old.

“I have an older dog at home, so I can't, I don't feel good about leaving her at a doggie daycare. I just can't do that.” (No. 1)

Another participant explained earlier some of the barriers that prevented her from traveling to see family. Here she cited one of them as her elderly dog.

“By doing it only once a year, I think it's a negative impact. I wish I could do it more often to see family. And once the dog dies, that might be . . . that will open up that option for me.” (No. 1)

This respondent admitted that when her dog passes away it will potentially enable her to travel more. A different participant also felt obligated to refrain from traveling because of a new pet in the household.

“More recently in the last four months we bought a house and rescued a rescue pup so she has cut into [our travel] a little bit cause she's new.” (No. 22)

Having pets that did not behave or were unpredictable also prevented one participant from traveling. Because of her disability she preferred to take her dog with her
everywhere including on long-distance trips.

“You know the previous dogs were questionable around other dogs, maybe leash aggressive, things like that. So where am I gonna go? Go somewhere where the dog is gonna go ballistic when she sees another dog?” (No. 8)

**Employment**

Many people declined taking their paid time off that might be used for travel because they felt an obligation to their workplace.

“I've got 300-something sick hours cause it's almost impossible for me to take a sick day cause I feel so guilty. There's so few people that are able and available to cover my shift, if one of the three night staff calls in and they cannot find someone to come in and cover it, the staff that has worked all day, my co-workers work 16-hour days straight, now have to break it down and cover it. Another 2 hours a piece at a time. Tell me that's not going to make me feel guilty. So unless I'm puking or can't get out of bed, or I mean I had a kidney stone, things like that, I'm going to work.” (No. 8)

Another participant also felt guilt in taking vacation time, especially because her role was multi-functional.

“There's only certain times of the year I can really travel. Then when I can travel I don't have tons of vacation time.” (No. 6)

One woman even canceled her vacation.

“I was supposed to go to Florida last week and I didn't go. My sister was staying
down there, but we were a man short, two people short here, so I covered two
departments, so I didn't want to leave anybody hanging, so I skipped the vacation
to [Florida].” (No. 17)

Being self-employed was also a barrier as a work-life balance was hard to create. As one
woman put it, she had to “make hay when the sun’s shining.” (No. 11) Another woman
who is a psychotherapist felt an obligation to her clients because of their reliance on her.

“It is a concern because I work with some clients for whom my even a brief
absence can be really disruptive for them in terms of just their overall stability.
I've gotten a little more comfortable with taking time off because I need to in
order to do my work. But yes, taking a vacation or taking even a long weekend or
a week off requires that for probably 50 percent of my clients I have to start
preparing them for that a month in advance.” (No. 15)

**Emotional**

There were several examples of barriers to travel that had to do with fear, whether that
meant leaving behind loved ones or fear of travel itself. One woman with older children
explained that she feared not being available for them.

“I have this fear, a mother fear, that I can't be too far away from my kids, and
that's why I chose you know, I don't want to work too far away from where I live
or where the kids go to school in case I need to be near them.” (No. 3)

The same respondent continued to explain that traveling to new places was an experience
that put her out of her comfort zone.

“Well I also too fear sometimes going to new places. So I think that might be
one of the things why I don't travel that much. I don't know. I just feel uncomfortable. It's not a familiar surrounding and there's nobody there that you know that's going to help guide you or something.” (No. 3)

More than one participant talked about their fears of travel which were associated with bad experiences when traveling. This ranged from hotel booking misunderstandings and being sick during air travel, to fears about new air travel regulations and bad weather events.

“It depends on how severe [the weather is] . . . that I might put off. Yes, that I might put off. My grandparents were killed in a car accident because of weather, so I would definitely avoid what's not necessary driving. Flying I think is a bit different.” (No. 10)

Discussion

The interviews with women which focused on long-distance travel and well-being were very instructive in providing detailed information, some which confirmed existing research and hypotheses and other new information. 12 main themes emerged from the interview transcripts which were used to address each of the research questions.

Long-distance travel did play an important role in overall well-being for most participants. This was related to several types of trips one would make. As supported by prior work, face-to-face contact with friends and family was one of the most common reasons for making long-distance trips. Participants felt that they needed to be physically in the same space as their important contacts in order to have meaningful connection. Certain activities such as holidays and family events necessitated traveling to farther
away destinations. In general, participants wished to have a break in their everyday routine. Many noted that a long weekend or weekend away would suffice as enough time to feel refreshed. A majority of participants worked in an office setting, thus, they felt that this often became monotonous. Others worked in very stressful environments or worked long hours and talked about needing the break for their mental health. Because of the routineness of their daily lives, many participants talked about seeking trips which provided adventures or new experiences. Some participants preferred certain destinations that were relaxing, had beautiful scenery, or were exotic, while others did not care where they went as long as it was somewhere that was new to them. There were also a small number of participants who made trips for medical reasons which required specialized care and therefore, travel outside of the state. Finally, travel envy was present during some interviews. Some participants were well aware of the little amount of travel they did and seemed to be embarrassed about it and jealous of others who were able to travel frequently. Often participants stressed that they still had fun on certain trips that they seemed to perceive as not being luxurious enough to fit their definition of vacation.

Overall, most participants had either friends or family whom were at a distance to them. Those who did not have the freedom of time or finances still talked about their desire to do so.

While the interviews did not touch upon traditionally sensitive information, participants sometimes embellished their claims during the interview in the amount of travel they did. This was identified and combatted by asking clarifying questions or addressing the issues in question at different points during the interview. It was apparent
that travel, no matter the reason, was a symbol of status among all of the participants, whether they were able to travel or not. Those who were able to travel at will expressed that they were very grateful or bragged about the trips they went on in the past. Most people seemed to desire travel, whether for it was for their mental health or to garnish their self-image.

Additionally, for those that could not travel as often as they desired, there were a multitude of barriers involved. The most common barrier was one’s financial resources. Finances were a subject that participants were careful about not giving specifics on. No matter what income category a participant fell into, everyone thought travel was expensive, especially when it came to air travel and other expenses incurred due to lodging and activities. The difference was that lower income participants talked more often than higher income participants about their wishes to visit relatives who lived far away more often.

Employment barriers were also common among most participants, no matter the job title. Many felt obligated to forgo taking their rightfully earned vacation hours because they felt they would be letting down their co-workers or that the amount of work piled up after returning from a trip would not be worth taking the trip in the first place. There seems to be a stigma against workers taking their vacation time. It seemed that some participants felt they would be judged for taking time off or they felt that they did not deserve it, even when they desired to travel.

A common household barrier was household structure. The women were often cognizant of their role in keeping everyone’s schedule. If a participant had school-age
children, this often limited travel to certain weeks in the year, which are also typically more expensive when it comes to vacation. Most women with families prioritized keeping a steady routine with less travel, although this was not always the case. Some participants with higher household incomes did travel often with their children and did not wait for school breaks. This may have to do with feeling less financial strain. Those who had both a strain on their schedule and finances seemed to be less able to readily make trips. There were many emotional factors that the women dealt with when considering travel. Many found it hard to leave behind pets in the care of others or children who had to stay in school in order to make a trip. Some participants feared travel itself, especially in regards to air travel. Most women felt very comfortable with driving and even talked about how much they loved driving their car places. Those who had not used air travel recently were unsure of new rules and restrictions. Additionally, women who had previous bad experiences flying or traveling far distances were less likely to make frequent long-distance trips. Some women also felt anxiety with the thought of departing from their daily routine when it came to consistent exercise, diet, and accomplishment of weekly chores. In general, departure from the known to the unknown was what made some women afraid or hesitant to travel.

**Conclusions and Recommendations**

This study examined three main areas: (1) the affect of travel on overall well-being, (2) how social network affects long-distance travel, and (3) the barriers that prevent doing long-distance travel. Both quantitative and qualitative methods were used for analysis. While sample size was small, the quantitative results helped to reinforce that income
level is not necessarily related to the geographic dispersion of one’s social network. It would follow that this would make some women disadvantaged as they do not have the financial and other resources to make trips with their desired frequency. This was confirmed during the interview portion of the study. Women of all income levels discussed the reasons why travel was important to them. In short, in-person contact with friends and family was very valuable to respondents that in the survey reported rather large social network geographies. Similarly, being able to break from their everyday routine and make new experiences was of great value. This was true no matter the socioeconomic status of the respondent. Participants from all different backgrounds also talked about the virtues of being able to “get away” for the sake of taking a mental break, reconnecting with loved ones, and enriching themselves with new experiences. Those with lower incomes were more limited in the amount of trips they could take. There were many commonalities though among the participants as to the barriers they faced to travel. However, those with higher incomes seemed more immune to the stresses some of the barriers caused when it came to figuring out a way to travel.

This study was exploratory and should be used to bolster new research directions regarding long-distance travel, well-being, and social networks. The study uncovered and defined key themes of long-distance travel’s role in well-being. The results pointed to important signs of inequity of access to destinations at distance. While the understanding on unmet long-distance travel demand may be lacking on a national level, these themes may be used to develop quantitative methods for geographically
representative sample sizes which seek to understand the deeper reasons behind unmet need, as well as the extent to which it exists.

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GENERAL CONCLUSIONS

As long-distance travel demand increases, it may be that there is an increasingly large disparity between those who can and cannot access destinations outside their home community. The limited research on long-distance travel has been conducted mainly in terms of observed travel using survey methods. This thesis attempts to bridge the gap between our understanding of realized travel and unmet need for long-distance travel. Previous methodologies that study long-distance travel tend to exclude latent demand. The issue is magnified by the fact that many who are transportation disadvantaged may not be included in survey-based data collection efforts. As such, the true need for long-distance travel in many populations may currently be underestimated.

The first article in the thesis measured the level of unmet demand of Vermonters. Overall, 22 percent were surveyed as having unmet local or long-distance need at least once per year. The study found that there is a correlation between those who are transportation disadvantaged at the local and longer-distance levels. While results indicated that many sociodemographic, household, and geographic variables had an effect on actual and unmet travel, as expected, the models were unable to fully capture the wide variation in level of travel. This travel survey-based method could not adequately address the complex reasons behind whether one would like to or needed to travel to more distant destinations. The results demonstrate the importance of increasing focus on unmet travel demand. Even within a travel survey it would be useful to repeat the unmet need questions but to provide more specific geographic thresholds for where one’s need was unmet. Additionally, the two questions on unmet demand only pertained to unmet
need that was due to a lack of transportation options. This narrow scope may have limited the number of respondents who identified as having unmet need. Other reasons for unmet need may include financial reasons, restrictions regarding time off or household scheduling, geographic limitations, and personal reasons.

The second article of the thesis answered the limitations in the use of travel survey methods alone for understanding travel behavior by using both quantitative and qualitative data to further explore unmet travel need in Vermont. The relationships in the quantitative data, describing the complexity of travel, social networks, and well-being, were variable possibility due to low sample size (N=22), but the analysis did demonstrate in general that those with lower levels of overall well-being traveled less often to visit family and friends and to go on a vacation or leisure trip. This may signify that doing less of these types of travel, or having unmet need, may be correlated with lower well-being.

The qualitative interview portion of the research was used to identify themes surrounding the long-distance travel that participants undertook. This analysis provided insight into motivations and the reasons why participants felt that it was necessary to travel. Two common themes were the need for in-person contact to maintain current relationships and to have experiences that were different from one’s day-to-day routine. The use of technology for telecommunications seemed to sustain relationships but was not the preferred method of interaction when compared to in-person. Most participants felt that they needed to visit their most important contacts in-person at least annually. Participants cited that in-person visits allowed for the physical interaction that many
craved, and for sharing events that required togetherness in a particular moment in time or at a specific place. More research should be conducted to understand how in-person contact varies with frequency of telecommunication, and to understand the situations where participants feel that one or the other is more appropriate. It is not well understood whether or how telecommunication affects the frequency of in-person long-distance trips and vice versa. It would be valuable to conduct further social network geography surveys in order to better understand the relationship between the spatial distribution of one’s social network, long-distance travel, and well-being. This would include examining if, and to what degree, social network extent drives long-distance travel and if the well-being of those with geographically large social networks who cannot participate in long-distance travel suffers accordingly. Last, a more socioeconomically diverse sample is desirable to truly understand the differences in realized travel and unmet demand among different groups.

Barriers to undertaking long-distance travel were grouped by theme and largely included financial, time, and emotional factors. During the interviews, participants found it difficult to separate trips they felt they needed to take from the trips they wanted to take. Often trips had elements of both obligation, which necessitated a trip, and pleasure that was a non-necessity by many participants’ standards. While many participants desired trips that were purely for enjoyment and relaxation away from home, trips to visit family and friends almost always took precedence. The richest of these results suggests that future travel equity research should incorporate interview or other qualitative methods when possible. While this may be infeasible in many studies due to lack of
resources, these interview results or others could be used to inform better survey questions to incorporate unmet need into consideration. At present, very few travel surveys include unmet demand for either local or long-distance travel.

The interviews in this thesis were semi-structured in order to make participants comfortable and to allow for fluid conversation. Interviews allowed for the collection of detailed information not possible with surveys; as such, recommendations for future interviewing methods are an important outcome of this thesis. Although this research did include a limited number of practice interviews within the research group and family members of the research group, the number was too small. Therefore, the first recommendation is to include a larger pre-test of interviews. The first round of test interviewees may be employed to test the flow and content of questions. The second larger round should be completed after interview questions are finalized. This is useful as a way for the interviewer to practice and to determine if interview results truly answer the research questions. Pilot interviews with actual subjects would have been helpful in this study for eliminating a large portion of off-topic or extraneous information. Additionally, the second round may be used to test the coding scheme developed during the first round of test interviews in order to test the validity of themes. Lastly, the interviews exposed how those without a transportation background understand, think of, and talk about transportation and travel. The way others speak about transportation may give clues to transportation researchers in how to better construct survey or interview questions to make sure they are getting the desired responses. Interviewers who are not transportation professionals may be important in this regard.
This thesis only begins to investigate a group of travelers who have long been neglected in national studies. It has found connections between long-distance travel, well-being, and one’s social network. More data and analysis are needed to understand the full extent of unmet long-distance travel need at the national level and by region. This thesis provides the groundwork and new insights into the complexity of this problem but also provides motivation to develop new methodologies.
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52. LaMondia, J., Aultman-Hall, L., & Greene, E. (2014). Long-Distance Work and Leisure Travel Frequencies: Ordered Probit Analysis Across Non-Distance-Based Definitions. *Transportation Research Record: Journal of the Transportation Research Board*, (2413), 1-12.


APPENDIX A

People and Travel Survey

Thank you for participating in the People and Travel Survey. Many things affect the places we go and what we do there. This survey is designed to help researchers understand how the people you know influence your travel choices to allow planners to better serve future travel needs.

The survey will take approximately 10 minutes to complete; it has 3 sections but most answers only require a check mark or a circle.

All responses that you provide will be confidential and anonymous. You may stop the survey or skip questions at any time. If you have any questions about this survey please contact Hannah Ullman or Lisa Aultman-Hall at the University of Vermont – (802) 656-1245.

Section 1 – People in your Life

The following questions describe people who may live in your city/town OR somewhere else in the world.

1. Think about a family member you don’t live with. (optional nickname:____________)

   □ No such person (go to #4 page 3)

   a) When was your last IN-PERSON FACE-TO-FACE contact with this person?

      □ within 1 MONTH □ within 1 YEAR □ more than 1 YEAR ago
      □ never

   b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?

      □ Yes □ No

   c) How close is your relationship with this person? (circle a number)

      | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
      | Very Close | Somewhat close | Not close at all |

d) Where does this person live? City/town:________________________
2. Think about another *family member you don’t live with.* (optional nickname:________)

□ No such person  (go to #4 next page)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
   □ within 1 MONTH    □ within 1 YEAR    □ more than 1 YEAR ago
   □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?
   □ Yes          □ No

c) How close is your relationship with this person? (circle a number)

   10  9  8  7  6  5  4  3  2  1  0
   Very Close  Somewhat close  Not close at all

   d) Where does this person live?  
   City/town:_______________________
   State or Country: _________________

3. Think about one last *family member you don’t live with.* (optional nickname:________)

□ No such person  (go to #4 next page)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
   □ within 1 MONTH    □ within 1 YEAR    □ more than 1 YEAR ago
   □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?
Think about a person you would go to for **work or professional advice**. (optional nickname:________________)

□ No such person (go to #5 below)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?

□ within 1 MONTH □ within 1 YEAR □ more than 1 YEAR ago □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?

□ Yes □ No

c) How close is your relationship with this person? (circle a number)

10 9 8 7 6 5 4 3 2 1 0

Very Close Somewhat close Not close at all

d) Where does this person live? City/town:__________________________

State or Country: ____________________

4. Think about a person you would go to for **personal advice**. (optional nickname:______)

□ No such person (go to #6 next page)
a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
   □ within 1 MONTH  □ within 1 YEAR  □ more than 1 YEAR ago
   □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?
   □ Yes  □ No

5. Think about a good friend. (optional nickname:________________)
   □ No such person  (go to #7 below)

   a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
      □ within 1 MONTH  □ within 1 YEAR  □ more than 1 YEAR ago
      □ never

   b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?
      □ Yes  □ No

   c) How close is your relationship with this person? (circle a number)
      10 9 8 7 6 5 4 3 2 1 0
      Very Close  Somewhat close  Not close at all

   d) Where does this person live?  City/town:_______________________
6. Think of a **childhood friend**. (optional nickname:________________)

   □ No such person (go to #8 next page)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
   □ within 1 MONTH   □ within 1 YEAR   □ more than 1 YEAR ago
   □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?
   □ Yes   □ No

c) How close is your relationship with this person? (circle a number)

   10  9  8  7  6  5  4  3  2  1  0
   Very Close  Somewhat close  Not close at all

d) Where does this person live?  
   City/town:_____________________

   State or Country: _______________

7. Think about a person you wish you could spend more time with.

   (optional nickname:________________)
□ No such person (go to #9 below)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
   □ within 1 MONTH  □ within 1 YEAR  □ more than 1 YEAR ago  □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?
   □ Yes  □ No

c) How close is your relationship with this person? (circle a number)

10 9 8 7 6 5 4 3 2 1 0
Very Close  Somewhat close  Not close at all

d) Where does this person live?
   City/town:_________________________
   State or Country: _________________

8. Think of a person for whom you feel an obligation to visit.
   (optional nickname:_______________)
   □ No such person (go to #11 next page)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
   □ within 1 MONTH  □ within 1 YEAR  □ more than 1 YEAR ago  □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?
   □ Yes  □ No

c) How close is your relationship with this person? (circle a number)
9. Think of another person for whom you feel an obligation to visit.

(optional nickname:________________)

□ No such person (go to #11 below)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
   □ within 1 MONTH □ within 1 YEAR □ more than 1 YEAR ago
   □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?

   □ Yes □ No

c) How close is your relationship with this person? (circle a number)

   10 9 8 7 6 5 4 3 2 1 0
   Very Close Somewhat close Not close at all

d) Where does this person live? City/town:________________________

   State or Country: __________________

10. Think of a person you have communicated with in the LAST YEAR who lives in FLORIDA.

   (optional nickname:________________)
   165
□ No such person  (go to #12 next page)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
   □ within 1 MONTH  □ within 1 YEAR  □ more than 1 YEAR ago
   □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?
   □ Yes  □ No

c) How close is your relationship with this person? (circle a number)

   10  9  8  7  6  5  4  3  2  1  0
   Very Close  Somewhat close  Not close at all

d) Where does this person live?
   City/town:_______________________
   State or Country: Florida

11. Think of a person you have communicated with in the LAST YEAR who lives in CALIFORNIA.

   (optional nickname:________________)

□ No such person  (go to #13 below)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?
   □ within 1 MONTH  □ within 1 YEAR  □ more than 1 YEAR ago
   □ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?
   □ Yes  □ No

   166
c) How close is your relationship with this person? (circle a number)

<table>
<thead>
<tr>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Close</td>
<td>Somewhat close</td>
<td>Not close at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Very Close
Somewhat close
Not close at all

d) Where does this person live?  City/town:__________________________

State or Country: California

12. Think of a person you have communicated with this past year who lives in EUROPE/ASIA.
(optional nickname:________________)

□ No such person  (go to Section 2 next page)

a) When was your last IN-PERSON FACE-TO-FACE contact with this person?

□ within 1 MONTH      □ within 1 YEAR      □ more than 1 YEAR ago
□ never

b) In the LAST MONTH, have you exchanged an email, phone call, text, video-chatted or similar with this person?

□ Yes      □ No

c) How close is your relationship with this person? (circle a number)

<table>
<thead>
<tr>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Close</td>
<td>Somewhat close</td>
<td>Not close at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Very Close
Somewhat close
Not close at all

d) Where does this person live?  City/town:__________________________

State or Country: _________________
Section 2 – Travel Frequency

1. Check approximately how often you make a trip to a destination more than 2 hours from where you currently live…

<table>
<thead>
<tr>
<th></th>
<th>More than once per Month</th>
<th>Once per Month</th>
<th>Multiple Times per Year</th>
<th>Once per Year</th>
<th>Less than Once per Year</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>To visit family or friends</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>For work</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>For personal business such as a medical appointment, banking or other services</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
2. Check approximately how often you make a trip …

<table>
<thead>
<tr>
<th></th>
<th>More than once per Month</th>
<th>Once per Month</th>
<th>Multiple Times per Year</th>
<th>Once per Year</th>
<th>Less than Once per Year</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>For vacation or leisure</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>That includes air travel</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>With NO overnight stay that includes air travel</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>With NO overnight stay and includes 2 or more hours of driving EACH way</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>That includes a destination outside of North America</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Section 3 – About you

1. What is your Home Zip Code?

2. Does your workplace allow you to work from home and other locations? (check all that apply)
   - □ No
   - □ Yes, and I often work from home or other locations
   - □ Yes, and I occasionally work from home or other locations
   - □ Yes, but I never work from other locations

3. What is your gender?
   - □ Male
   - □ Female
   - □ Other

4. What is your birth year?

5. What is your employment status? (check all that apply)
   - □ employed full-time
   - □ employed part-time
   - □ not currently employed
   - □ fulltime student
   - □ retired
   - □ not currently employed

6. Circle the number of people including yourself who live in your residence.
   - □ 8+  □ 7  □ 6  □ 5  □ 4  □ 3  □ 2  □ 1

7. With whom do you live? (check ALL that apply)
   - □ spouse or significant other (married or unmarried)
   - □ roommate(s) (unrelated adult(s))
   - □ child(ren) under 5 yrs old
8. What is your highest level of education?
   □ high school or some high school
   □ bachelor’s or associate’s degree
   □ graduate or professional degree
   □ some college

9. Do you have pets? (check ALL that apply)
   □ large dog(s)  □ small dog(s)  □ cat(s)  □ other pets  □ no pets

10. How often do your pets affect your travel choices?
    □ always  □ frequently  □ infrequently  □ never

11. Circle the number of registered motor vehicles (passenger cars, pick-up trucks, sport utility vehicles, vans/minivans, and motorcycles) you have in your household. (circle one)

    8+ 7 6 5 4 3 2 1 0

12. Do you have a cell phone?
    □ Yes  □ No

13. Where do you access the internet? (Check ALL that apply)
□ at home
□ at school
□ at work
□ at a public space (e.g. library)
□ cell phone
□ I do not have access to the Internet

14. Which of the following categories best describes your 2016 household income before taxes?
Please include income from all sources for all persons with whom you share income.

□ Less than $15,000
□ $15,000 to $24,999
□ $25,000 to $49,999
□ $50,000 to $99,999
□ $100,000 to $149,999
□ $150,000 to $199,999
□ $200,000 or more
□ Prefer not to answer

Thank you. If you would like to be contacted to receive more information or results of the study, please provide your email address:
APPENDIX B

Interview Questions

Part A
1. When someone talks about traveling, what comes to mind for you?
2. Is travel to places beyond the city or town where you live important to your life? Why or why not?
3. Can you give me an example of two different types of trips: One that you feel you NEED to take and one that you feel you WANT to take?
4. What do you think the difference is between trips that you need to take and ones that you want to or would like to take?
5. [Only if they had only talked about local trips up until now] Now thinking about long-distance trips, or those over 100 miles one-way, is there a difference between the trips that you need to take and the ones you want to take?

Part B
Now think about WORK trips and PERSONAL or LEISURE/PLEASURE trips as separate things.
1. Ideally, how often would you like to take personal pleasure/leisure trips to places beyond the town or city where you currently live?
2. Where do you travel for these trips? [If they gave only local answers: Now think about trips that are ~>100 miles each way; answer the above questions again.]
3. Do you ever travel for work?
   a. [If participant travels for work]: Do you think work trips increase or decrease (or not effect) the number of personal trips that you make in a year?
   b. If you had to double your current work travel, how do you think this would affect your life?
   c. How often do you combine personal and work trips?
   d. Do you like traveling for work? Why or why not?
   e. [If participant does not travel for work]: Would you like to travel for work? Why or why not?
4. Do you ever make personal out-of-town trips for family care, medical services, or other obligations – things you might not consider pleasure? What are the reasons for making these trips?

Part C
1. What factors affect your decisions for how often you take trips?
2. How does how often you take trips either benefit or have a negative impact on your life?
a. If you had to decrease/increase the amount you travel, how do you think that would affect your life?
3. How does the trip destination affect your trip satisfaction?
4. How does car access affect your life and the trips you make outside your hometown?
5. How does the cost of vehicle travel affect your trip making?
6. How does access to air travel affect your life?
7. How does the cost of using air affect your trip making?

Part D

1. Would you like to revisit any questions?
2. Do you have any questions or other comments for me?
APPENDIX C

Post Interview Survey

Thank you for completing the interview portion of the study session. This post interview survey was designed to help researchers understand how you feel about your overall well-being or your life in general.

The post interview survey will only take a few minutes to complete and contains two sections.

All responses that you provide will be confidential and anonymous. You may stop the post interview survey at any time. If you have any questions about this survey please contact Hannah Ullman or Lisa Aultman-Hall at the University of Vermont – (802) 656-1245.

Section 1 – Your Overall Well-being

Below are five statements that you may agree or disagree with. Using the scale below, indicate your agreement with each item by checking the appropriate box for each statement. Please be open and honest in your responding.

Please check one box per statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neutral</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>In most ways my life is close to my ideal.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The conditions of my life are excellent.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I am satisfied with my life.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>So far I have gotten the</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
important things I want in life.

If I could live my life over, I would change almost nothing. □ □ □ □ □ □ □ □

Section 2 – Travel and Well-being

Out-of-town travel can be a joy or a burden. Some people believe that traveling improves their overall well-being or quality of life. Some believe the opposite.

When you think about travel and your well-being or quality of life, which of the following is most true (check one):

□ Increasing travel would increase my overall well-being.

□ Decreasing travel would increase my overall well-being.

□ Changing my level of travel would not affect my overall well-being.