



# Improving Veteran Mobility in Small Urban and Rural Areas

**February 2014**

**prepared for**

US DOT

**prepared by**

Del Peterson

North Dakota State University  
Upper Great Plains Transportation Institute  
Small Urban and Rural Transit Center

# Improving Veteran Mobility in Small Urban & Rural Areas

Prepared for:

U.S. Department of Transportation

Prepared by:

Del Peterson

North Dakota State University  
Upper Great Plains Transportation Institute  
Small Urban and Rural Transit Center  
Fargo, ND

**Final Report**

**21177060-NCTR-NDSU02**

**February 2014**

**National Center for Transit Research**

*A USDOT Transit-focused University Transportation Center consortium led by University of South Florida*  
4202 E. Fowler Avenue, CUT100, Tampa FL 33620-5375 [www.nctr.usf.edu](http://www.nctr.usf.edu)

Member universities: University of South Florida, North Dakota State University,  
University of Illinois at Chicago, Florida International University

## **Acknowledgements**

The author thanks Lyn Hellegaard, executive director for the Missoula Ravalli Transportation Management Association, for her assistance with survey development and distribution. This report would not have been possible without her assistance. Funding for this study was provided by the United States Department of Transportation through the National Center for Transit Research within the Center for Urban Transportation Research at the University of South Florida. The Small Urban & Rural Transit Center within the Upper Great Plains Transportation Institute at North Dakota State University conducted the research. This report was written by Del Peterson.

## **Disclaimer**

The contents presented in this report are the sole responsibility of the Upper Great Plains Transportation Institute and the author.

North Dakota State University does not discriminate on the basis of age, color, disability, gender expression/identity, genetic information, marital status, national origin, public assistance status, sex, sexual orientation, status as a U.S. veteran, race or religion. Direct inquiries to the Vice President for Equity, Diversity and Global Outreach, 205 Old Main, (701)231-7708.

## ABSTRACT

The need for veteran transportation is growing rapidly because of the increasing number of older veterans as well as the numerous injured service men and women returning from Iraq and Afghanistan. Currently, for every fatality in Iraq, there are 16 wounded or injured soldiers. This represents an injury rate five times greater than during the Vietnam War. Thirty percent of veterans live in rural areas that often present transportation challenges. Many veterans in rural areas must travel extremely long distances to receive medical care, and veterans living in rural areas are reported to be in poorer health than veterans living in urban areas.

The objective of this study was to identify veterans with mobility needs currently living in rural Minnesota, Montana, and North Dakota, and to quantify the cost of feasible transportation options for meeting veteran mobility needs. Special attention was given to the medical transportation of veterans to VA health care centers. This study included a survey of veterans and a simulation of their health care transportation costs.

Online and paper surveys were distributed to veterans throughout Minnesota, Montana, and North Dakota. More than 80% of respondents classified themselves as disabled with nearly three-fourths of these indicating that their veteran disability rating is greater than 30%. The most common disability survey respondents reported having was a mobility impairment, followed by hearing impairment and mental health issues.

When simulating a coordination effort between VA health care centers and rural public transit agencies using @Risk risk analysis software, results varied by state and region because of varying operating costs and fare recovery rates. Minnesota simulations had the highest fare recovery rate compared to Montana and North Dakota. Simulated veteran medical trips serving the Sioux Falls, SD, VA Health Care Center had the highest cost per mile and fare recovery rate compared to other regional veteran health care centers in Fargo, ND, St. Cloud, MN, and Missoula, MT. Overall, most simulations indicated that a coordination effort between VA health care centers and rural public transit agencies would be feasible if estimated ridership levels could be attained.

## **EXECUTIVE SUMMARY**

There are approximately 22 million military veterans in the United States (Department of Veteran Affairs 2013). Veterans represent a unique population subset that differs from the total U.S. population in gender, age, and racial composition. These characteristics, among others, present significant mobility challenges for veterans and their families. Overall, the veteran population is overwhelmingly male and older than the non-veteran population. The high percentage of older male veterans is due to a large number of World War II, Korean, and Vietnam-era veterans, according to the American Community Survey (2010). Veterans residing in rural areas represent almost 30% of the total veteran population and 41% of the total enrolled veteran population in the Department of Veterans Affairs Health Administration (VHA) system (National Center for Veterans Analysis and Statistics 2012). The National Center for Veterans Analysis and Statistics (2012) found that the isolation of rural areas creates unique challenges for veterans living in these communities. The authors highlighted four ways that rural communities differ from urban communities: demographic composition; social ties and social capital; culture; and infrastructure and institutional support.

Compared to urban veterans, rural veterans were found to be less racially diverse, less educated, more disabled, and of lower income than their urban counterparts. A higher percentage of rural veterans also had service-connected disability ratings above 50% compared to urban veterans. This was attributed to the high percentage of older male veterans residing in rural areas. Veterans living in rural areas are also reported to be in poorer health than those in urban areas (Burkhardt et al. 2011), with numerous wounded veterans requiring assistance with mobility for life-essential activities and employment.

Rall and Wheat (2013) developed in-depth case studies and detailed profiles of all 50 states focusing on state-level activities to enable improved access to transportation for all military veterans. They found that many states are working to ensure that veterans have a dedicated form of transportation for their everyday and special travel needs. However, survey respondents in their study were often unable to provide specific information showing measurable increased transportation for veterans. Instead, they mentioned coordination efforts that can improve services and develop lines of communication between agencies. The ability to target veterans with outreach materials was found to be a key lesson learned. Rall and Wheat (2013) also found that a general mistrust of government may be present. It may be beneficial to use nonprofit groups or local agencies to encourage veteran transportation planning when mistrust is present. Keeping peer-to-peer resources in mind was also found to be helpful given the tight-knit nature of the military community.

### **Surveys**

The Small Urban and Rural Transit Center (SURTC) designed online and paper surveys to distribute to veterans. Both surveys contained questions regarding veteran travel patterns and mobility issues. The online survey was distributed via email to Veterans Service Officers (VSO) and Veterans Affairs representatives throughout Minnesota, Montana, and North Dakota. Small urban and rural counties were targeted. A total of 107 online surveys and 33 usable paper surveys were received, providing 140 viable surveys.

More than 80% of participants had a disability, with a wide range of disability ratings. Nearly 70% indicated they drive their own vehicle, and 13% replied that they usually travel as a passenger in a private vehicle. Nine percent rely on veteran transportation services, and another 9% rely on public transportation for their travel needs.

Veterans were also asked how far they are required to travel to get to a veteran health care facility. About one-third of respondents reported that they travel less than 30 miles one-way to their veteran health care facility. Another third indicated they travel between 31 and 60 miles, while the final third travel more than 60 miles one-way to receive medical services.

## **Simulations**

Simulations were conducted from a transit agency perspective to determine when it would be cost-effective for public transit agencies to transport veterans to Veterans Affairs (VA) health care centers. These simulations predicted the number of veteran passengers needed for every health care center medical trip so that current fare recovery levels are equaled or surpassed. Simulations were conducted for Minnesota, Montana, and North Dakota, as well as transit agencies that serve VA health care centers in Fargo, ND, St. Cloud, MN, Sioux Falls, SD, and Missoula, MT.

Each veteran medical trip was assumed to be unique and dependent on personal preferences and constraints. Simulations are useful to help account for the uncertainty in travel behaviors. Data used in simulations were collected from a combination of the Rural National Transit Database (RNTD 2011), the Department of Veterans Affairs (2013), and survey findings. Three essential variables used throughout the simulations included the state average operating expense per mile; the fare recovery percentage (percentage of operating expenses covered by fare revenues) for rural public transit agencies in Minnesota, Montana, and North Dakota; and the VA travel reimbursement per mile.

Results show that with a VA reimbursement rate of 10 cents per mile for a 90-mile round trip, transit agencies in Minnesota must transport six passengers to exceed their current fare recovery level while Montana and North Dakota need to only transport two and three passengers, respectively. This is due to the higher fare recovery level in Minnesota compared to the other two states. As the VA reimbursement rate increases, fewer passengers must be transported per trip to surpass current fare recovery levels. Also, the simulation results included no fare charged to the passenger by the transit agency.

VA health care center regional scenarios were developed to simulate coordination efforts for rural public transit agencies that could potentially serve regional VA health care centers. Four regional veteran health care markets were analyzed: Fargo, ND, St. Cloud, MN, Sioux Falls, SD, and Missoula, MT. These four locations were chosen because nearly 70% of survey respondents receive veteran medical care at one of these centers. Coordinated travel simulations between VA health care centers and rural public transit agencies were completed at three different mile radiuses from each VA health care center: 30, 60, and 100 miles.

The 60-mile round trip simulation for the Fargo, ND, VA health care center showed that two passengers would need to be transported to equal current transit fare recovery rates with a VA reimbursement of 10 cents per mile, while three and four passengers would be required to cover the fare recovery rate for the 120- and 200-mile round trips, respectively. Obviously, the number of passengers required to cover the fare recovery declines as the VA reimbursement rate increases. More passengers were required to meet fare recovery levels for the longer trips as the 200-mile trip had a fare recovery percentage of more than 12% while the other two trips had fare recovery rates between 8% and 9%. This occurred because the transit agencies serving the outer range of the service area had higher fare recovery rates compared to those serving the area closer to the Fargo, ND, VA health care center.

## Key Findings

*Key Finding #1: Transit agencies can increase ridership and VA health centers can lower beneficiary travel costs if they coordinate services.*

Simulation results showed that if VA health care centers can transfer travel beneficiary eligible veterans to public transit and discourage them from driving their own personal vehicles, they will be able to lower their current 41.5 cent per mile reimbursement rate paid directly to veterans by reimbursing transit agencies between 10 and 30 cents per mile to provide transportation services. From a transit agency point-of-view, results showed that if a small number of veterans, usually between 1 and 4 per trip, would choose transit rather than drive their own vehicles to VA health care appointments, transit agencies could meet or exceed their current fare recovery rates. Results were estimated based on transit agency cost per mile, fare recovery rates, and location specific information.

Example: If a VA health center can lower transportation payments from 41.5 to 20 cents per mile by utilizing public transit to provide the service, they could save nearly \$16 per 100 mile round-trip [ $(\$0.415 - \$0.20) \times 100 - \$6$  deductible] in travel reimbursements. The average transit agency, based on simulation results, would be able to meet or exceed their current fare recovery levels with between 1 and 4 veteran riders based on these same numbers.

VA beneficiary travel expenses have more than doubled during the past four years (from \$373 million in 2008 to \$861 million in 2012). Results show a potential win-win for both rural transit agencies and VA health care centers. Coordination efforts between transit and VA health care could save the VA between \$10 and \$30 in transportation costs for every medical trip, yielding thousands of dollars in total savings every year. Transit agencies could increase their ridership and better utilize their service while potentially increasing current fare recovery levels.

*Key Finding #2: Study results can serve as a service planning tool for rural transit agencies.*

Individual transit agencies can compare their current cost/mile and fare recovery levels to those in the simulations to gauge the feasibility of pursuing a coordination effort with their local VA. They can also determine the feasibility based on their location and knowledge of local veterans who may be eligible for VA travel benefits. State-wide and regional findings can be used to determine their best service scheduling technique.

Coordinating with VA health care centers would provide another funding stream for rural transit. Further, the 2013 Rural Transit Fact Book showed that for rural commuter transit service, there is excess capacity available and many rural transit agencies already serve larger communities where VA health care centers are located.

*Key Finding #3: This is an optimal time to begin talking about strategies for rural transit to transition aging veterans from personal vehicles to public transit.*

Survey findings showed that veterans rely heavily on their personal automobiles for transportation to medical appointments and everyday services, while few use public transit. Many rural veterans, as they age, will require transportation options other than their personal vehicles, and rural transit services can help fill that mobility gap. Offering veterans fare free trips to VA medical appointments may be an effective marketing tool. Rural transit could also offer transit travel training to veterans to ease their concerns about riding the bus.

Many veterans, like the country's population as a whole, are aging. Vietnam veterans, for example, are currently in their 60s and early 70s. Numerous studies have shown that as people age, both their ability and willingness to drive long distances decrease. A coordination effort involving a marketing campaign between VA health care centers and transit agencies would make veterans aware of other options for their VA medical trip needs.

# TABLE OF CONTENTS

1. INTRODUCTION .....	1
1.1 Objective.....	1
1.2 Organization of Content.....	1
2. LITERATURE REVIEW .....	2
2.1 National Perspective .....	2
2.2 Local Issues and Initiatives .....	3
2.3 Minnesota, Montana, and North Dakota Activities .....	4
3. VETERAN MOBILITY SURVEY .....	6
3.1 Survey Design and Administration .....	6
3.2 Profile of Respondents .....	6
3.3 Mobility and Travel Patterns.....	9
4. SIMULATION OVERVIEW AND RESULTS .....	16
4.1 Methodology .....	16
4.2 Data and Definitions .....	17
4.3 State Simulation Results .....	18
4.4 VA Health Care Center Simulation Results.....	20
4.5 Summary .....	26
5. SUMMARY AND CONCLUSIONS .....	27
REFERENCES .....	28
APPENDIX A.....	30

## LIST OF TABLES

Table 4.1 Essential Simulation Variables .....	17
Table 4.2 State Simulation Variables.....	18

# LIST OF FIGURES

Figure 3.1 Respondent gender ..... 6

Figure 3.2 Participant age ..... 7

Figure 3.3 Marital status ..... 7

Figure 3.4 Ethnicity ..... 7

Figure 3.5 Highest education level attained ..... 8

Figure 3.6 Annual household income ..... 8

Figure 3.7 Veteran group membership ..... 9

Figure 3.8 Disabled veterans ..... 9

Figure 3.9 Veteran disability ratings ..... 10

Figure 3.10 Veteran disabilities ..... 10

Figure 3.11 Typical travel modes ..... 11

Figure 3.12 Veteran medical service locations ..... 11

Figure 3.13 Travel mode to veteran medical appointments ..... 12

Figure 3.14 Distance traveled to veteran medical services ..... 12

Figure 3.15 Frequency of veteran health care appointments ..... 13

Figure 3.16 Veteran travel mode to work ..... 13

Figure 3.17 Veteran travel distance to work ..... 14

Figure 3.18 Essential and social activities performed ..... 14

Figure 3.19 Travel mode to essential and social activities ..... 15

Figure 4.1 ND fare recovery, 90-mile round trip ..... 17

Figure 4.2 State level simulations, 90-mile round trip ..... 19

Figure 4.3 State level simulations, 90-mile round trip including a \$10 transit fare ..... 20

Figure 4.4 State level simulations, 90-mile round trip, 20 cent per mile VA reimbursement ..... 20

Figure 4.5 VA health care center travel regions simulated ..... 21

Figure 4.6 Fargo, ND, veteran health care simulations ..... 22

Figure 4.7 Fargo, ND, simulations, 20 cent per mile VA reimbursement ..... 22

Figure 4.8 St. Cloud, MN, veteran health care simulations ..... 23

Figure 4.9 St. Cloud, MN, simulations, 20 cent per mile VA reimbursement ..... 23

Figure 4.10 Sioux Falls, SD, veteran health care simulations ..... 24

Figure 4.11 Sioux Falls, SD simulations, 20 cent per mile VA reimbursement ..... 24

Figure 4.12 Missoula, MT veteran health care simulations ..... 25

Figure 4.13 Missoula, MT simulations, 20 cent per mile VA reimbursement ..... 25

# **1. INTRODUCTION**

The need for veteran transportation is growing rapidly because of the increasing number of older veterans as well as the numerous injured service men and women returning from Iraq and Afghanistan. Currently, for every fatality in Iraq, there are 16 wounded or injured soldiers. This represents an injury rate five times greater than during the Vietnam War (Walsh 2010). Thirty percent of veterans live in rural areas that often present transportation challenges, and there is now a high prevalence of veterans of all ages in rural America. Many rural area veterans have special mobility needs and must travel extremely long distances to receive medical care. Veterans living in rural areas are also reported to be in poorer health than veterans living in urban areas, (Burkhardt et al. 2011), while numerous wounded veterans require assistance regarding mobility for life-essential activities as well as employment.

## **1.1 Objective**

The objective of this study was to identify veterans with mobility needs currently living in rural Minnesota, Montana, and North Dakota, and to quantify the cost of feasible transportation options for meeting veteran mobility needs. Special attention was given to the medical transportation of veterans to VA health care centers. The feasibility of a coordination effort between VA health care centers and rural public transit agencies for transporting veterans to medical appointments was another objective measured in this study.

## **1.2 Organization of Content**

The study begins with a literature review. Research papers and other applicable materials address veteran mobility issues from both national and local perspectives. A section on state-specific initiatives is also discussed. Following the literature review are results from a veteran mobility survey conducted in Minnesota, Montana, and North Dakota which highlights current veteran transportation options and constraints. Next is a simulation overview and results chapter that looks specifically at a hypothesized coordination effort between VA health care centers and rural public transit agencies. Finally, an overall summary concludes the study with recommendations based on research findings.

## 2. LITERATURE REVIEW

### 2.1 National Perspective

There are approximately 22 million military veterans in the United States today (Department of Veteran Affairs 2013). Veterans represent a unique population subset that differs from the total U.S. population in gender, age, and racial/ethnic composition. Overall, the veteran population is overwhelmingly male and much older than the non-veteran population. Veterans residing in rural areas represent almost 30% of the total veteran population and 41% of the total enrolled veteran population in the Department of Veterans Affairs Health Administration (VHA) system (National Center for Veterans Analysis and Statistics 2012). These characteristics, among others, present significant mobility challenges for veterans and their families. These challenges are highlighted in the following discussion.

Burkhardt et al. (2011) found that notable challenges for veterans' transportation included:

- The need for increased veteran transportation services due to a surge in veteran injuries. Currently, for every fatality recorded in Iraq, there are 16 wounded or injured soldiers.
- The unexamined cost effectiveness of transportation services: \$750 million was spent in FY 2010 by the VHA on Beneficiary Travel.
- The challenges for transportation service in rural areas as younger veterans who served in Iraq and Afghanistan are more likely than other veterans to reside in rural areas. They also may need to travel significant distances to receive adequate medical care and they are reported to be in poorer health than veterans living in urban areas.
- Veterans who miss medical appointments because of a lack of sufficient transportation in rural areas often exhibit higher rates of depression and suicide.
- Administrators of local transportation services for veterans are often unaware of other travel options for accessing medical and other life-essential activities.

The age distribution for rural veterans showed a high percentage of older males due to a large number of World War II, Korean, and Vietnam-era veterans, according to the American Community Survey (2010). The National Center for Veterans Analysis and Statistics (2012) found that the isolation of rural areas creates unique challenges for veterans living in these communities. The authors highlighted four ways that rural communities differ from urban communities: demographic composition; social ties and social capital; culture; and infrastructure and institutional support. Compared to urban veterans, rural veterans were found to be less racially diverse, less educated, more disabled, and have lower incomes than their urban counterparts. A higher percentage of rural veterans also had service-connected disability ratings above 50% compared to urban veterans. This was attributed to the high percentage of older male veterans residing in rural areas.

The National Resource Center for Human Service Transportation Coordination (NRC) was established to provide states and communities with support to better integrate public transportation services within human service networks including those that serve American veterans and their families. A 2011 report by the NRC looked at the transportation needs for veterans and their families. They found that veteran transportation challenges arise from many areas including service-related disabilities because of an increase in older veterans who need advanced medical care; needs for improved mobility for veterans to access work or education; and a focus on not just veterans, but also their families and dependents. Key groups that need to be involved in addressing these challenges include community, public transit, and human service transportation providers.

The NRC believes that connecting veterans with vital mobility options is essential to improve their way of life, and are committed to doing its part to improve the mobility needs of American veterans (NRC 2011). The Disabled American Veterans (DAV) organization has been essential in providing veterans access to the full range of benefits available to them. In 2012 alone, the DAV assisted veterans and their families with more than 300,000 claims for VA benefits, obtaining more than \$5 billion in benefits. One of DAV's largest volunteer programs is its nationwide transportation network through which volunteers provide rides to veterans who need help getting to and from VA medical centers (Disabled American Veterans 2012). In 2012, the DAV Transportation Network provided nearly 2 million volunteer hours and drove more than 27 million miles to give nearly 800,000 free rides to veterans. Using the value per hour rate of \$21.79 developed by Independent Sector, a nonprofit oversight organization, the value of these hours contributed to the transportation network was more than \$41,000,000 (Disabled American Veterans 2012).

The DAV communication staff is also heavily involved in producing news releases, speeches, videos, and other materials that provide information about DAV transportation options and other services. They have also grown their social media community in an attempt to engage younger veterans. Their Facebook "reach," which is the number of unique people who have seen content from their Facebook page, increased from 268,000 in 2011 to nearly 3 million in 2012, and the number of people talking about the DAV on their own Facebook pages and Twitter feeds has increased substantially as well (Disabled American Veterans 2012).

New Veterans Administration (VA) grants are targeted to support new transportation services for veterans living in highly rural areas. The grants are designed to aid state Veteran Service Agencies and Veteran Service Organizations (VSOs) in operating or contracting for transportation to give veterans greater access to VA medical centers and other facilities that provide VA care. Transportation will be provided at no cost to veterans. VSOs and state Veteran Service agencies can apply for grants up to \$50,000 for transportation that can be provided by agencies including private bus or van companies. Counties that are "highly rural," as defined by the grant application, have a population of fewer than seven persons per square mile. A top priority highlighted by the Department of Veterans Affairs, and targeted by these grants, is increasing access to VA care and services for veterans wherever they live (Office of Public and Intergovernmental Affairs 2013).

## **2.2 Local Issues and Initiatives**

Rall and Wheat (2013) developed in-depth case studies and detailed profiles of all 50 states focusing on state-level activities to enable improved access to transportation for all military veterans. They found that many states are working to ensure that veterans have a dedicated form of transportation for their everyday and special travel needs. Numerous survey outreaches were conducted with state legislatures, departments of transportation (DOTs), transit agencies, departments of veterans' affairs, and other transportation coordinating councils.

Survey respondents were often unable to provide specific information showing measurable increased transportation for veterans. Instead, they mentioned coordination efforts that can improve services and develop lines of communication between agencies. The ability to target veterans with outreach materials was found to be a key lesson learned. Also, collecting baseline data that identifies veteran riders was found to be necessary along with improved efforts to understand the cultures of the different coordinating agencies. Rall and Wheat (2013) also found that a general mistrust of government may be present. It may be beneficial to use nonprofit groups or local agencies to encourage veteran transportation planning when mistrust is present. Keeping peer-to-peer resources in mind was also found to be helpful given the tight-knit nature of the military community.

State profiles were also developed for all 50 states that responded to the survey. Many states and local communities are providing information about services available to veterans and their families. The All the Way Home organization, for example, is an organization reaching three states in the Midwest that sponsors regional conferences for area veterans. The 2010 All the Way Home Conference in Dubuque, IA, was attended by 1,600 local residents who visited more than 97 veteran-related exhibits. The Fourth All the Way Home Conference was held in 2013 with the goals of providing a forum to veterans and their families' access local services, to provide an opportunity for the local community to thank veterans for their service, and to coincide with the return of National Guard Troops. Local organizers have found that conferences like these create an enormous amount of local support and opportunities for coordinated, veteran-focused, transportation efforts (All the Way Home 2013).

Burkhardt et al. (2011) highlighted two rural innovative cases designed to provide enhanced veteran mobility. They are located in Montrose, CO, and Price County, WI. All Points Transit (APT) out of Montrose, CO, is the only local transportation provider for veterans in its two-county service area. From May through December 2009, APT provided 1,042 trips for veterans. About 70% of the trips brought veterans to the VA Medical Center (VAMC) in Grand Junction, CO, which is an approximate round trip of 120 miles. Most of these trips are billed directly to the Grand Junction VAMC. Veterans who are less than 60 years old pay \$20 per trip while those older than 60 are asked to provide donations for local trips. The Grand Junction VAMC likes having access to full-time staff members who can handle ride requests from veterans, and they no longer need to worry whether or not veterans can get to their appointments. They previously found that volunteers responsible for taking veteran ride requests were not always available.

Price County in northern Wisconsin does not offer public transit service. The local veterans office coordinates with the Price County Human Service Commission on Aging (COA) to utilizing volunteer drivers to provide rides for veterans in need. The most common trip scheduled is a four-hour trip to the Madison VAMC. Volunteer drivers are reimbursed 50 cents per mile, and volunteer drivers often work more than eight hours a day transporting veterans. This coordination effort allows veterans to travel to their medical appointments with very little expense. Also, unlike scheduled fixed-route service, volunteers are often flexible and willing to travel when others are not. However, the service operates on a first-come first-serve basis, so some requests cannot be met if volunteers are currently busy. The Price County veterans transportation program currently accounts for about 6 percent of the COA's total rides provided while helping veterans feel confident they can obtain quality medical services when needed (Burkhardt et al. 2011).

## **2.3 Minnesota, Montana, and North Dakota Activities**

This research focuses on veteran transportation in Minnesota, Montana, North Dakota, and the surrounding area. The following is a discussion based on related veteran transportation issues throughout these three states. North Dakota has used its Post War Trust Fund to help finance veteran transportation throughout the state. In 1996, North Dakota citizens voted to create a trust fund providing benefits to existing and future North Dakota veterans and their families. It is designed to provide income to the Administrative Committee on Veterans Affairs for programs benefiting veterans. \$315,000 in total earnings was reported to fund the Postwar Trust Fund for the 2011-13 biennium (North Dakota Office of State Treasurer 2013). Specifically, the trust fund underwrites part of a state veterans' transportation system that offers free rides to the VA medical center in Fargo, ND, using five vans on scheduled fixed routes. The North Dakota Legislature also provided funding to purchase vans for the transportation system while the VA provides funds for operating costs (North Dakota Department of Veterans Affairs 2013).

In 2012, the city of Grand Forks, ND, received a Veterans Transportation and Community Living Initiative (VTCLI) grant to work with the North Dakota Department of Transportation (NDDOT) and other organizations to expand a call and online center into a statewide one call/one click center. This will enable veterans to access a vast amount of information, including information on transportation that will aid them in making decisions regarding medical and everyday needs. The more than 62,000 North Dakota veterans and active-duty military will have access to this resource (Federal Transit Administration 2012).

The VA medical center in Fargo is also utilizing more telemedicine to provide services to rural veterans. When transportation options are not available, or are limited, telemedicine allows for medical services such as patient consultations via video conferencing, transmission of still images, and remote monitoring of vital signs, among others. The Fargo VA Medical Center uses what they call “peripherals,” stethoscopes, otoscopes and other medical equipment on a telemedicine cart that a technician can use via physician direction. The carts also contain high-resolution cameras that give clear, ultra close-up views of the subject allowing for quick, accurate diagnosis. Telemedicine can also be used for consultations for specialties as well as mental health and pharmacy services. During fiscal year 2012, the Fargo VA spent \$281,592 in direct telemedicine costs reaching nearly 3,000 patients in the region (Schmidt 2013).

South Dakota was awarded VTCLI funds to be used by Prairie Hills and River Cities transit. The intent is for these two agencies to create a base for a statewide one-call/one-click center. Funds will also be used for a joint education and outreach campaign to promote the center. Outreach will include a marketing campaign with a single logo and vehicle wraps that will serve as visible, moving advertisements for the center (Federal Transit Administration 2012).

Minnesota is the only one of the three states within the main focus of this research that has a state coordinating transportation council. The Minnesota Council of Transportation Access (MCOTA) must include the commissioner of veterans’ affairs to help organize and coordinate veteran transportation initiatives. One of their main accomplishments highlighted in their most recent annual report was their successful VTCLI grant application. The grant will allow MCOTA to create a centralized database of available transportation providers throughout Minnesota. It will also be able to expand its existing one-call/ one-click center to allow the more than 68,000 veterans statewide, along with their families, to easily access information regarding public and private transportation options (MCOTA 2013).

Minnesota state law also requires that transit agencies receiving state operating assistance provide free rides to veterans with permanent, service-connected disabilities. This law went into effect July 1, 2009 (Minnesota Statutes 2013). The Minnesota Legislature appropriated \$140,000 per year in 2011-13 to support this benefit for disabled veterans (Rall and Wheat 2013).

Montana received its VTCLI funds in 2012 to develop a state wide, web-based, veterans transportation system. Great Falls Transit was given the lead in the project. The Montana Department of Transportation (MDT) along with the Montana Veterans Affairs Division also plans to continue working with the federal VA’s Veterans Transportation Service (VTS) to offer veteran transportation information statewide. Montana has a number of local transit advisory committees who encourage veteran organization input as well (Rall and Wheat 2013).

The VA Montana Health Care System is one of 47 sites that use the VTS program. It has 11 vans statewide to helping veterans overcome transportation barriers to treatment. The state of Montana encompasses more than 147,000 square miles and ranked second in the nation for 2010 with 23,000 veterans transported. It also ranked fifth in the nation in miles driven with more than 1 million miles in 2010. The VTS program increases transportation options for veterans and utilizes technology such as ride-sharing software and global positioning systems (GPS) to improve efficiency (Uken 2011).

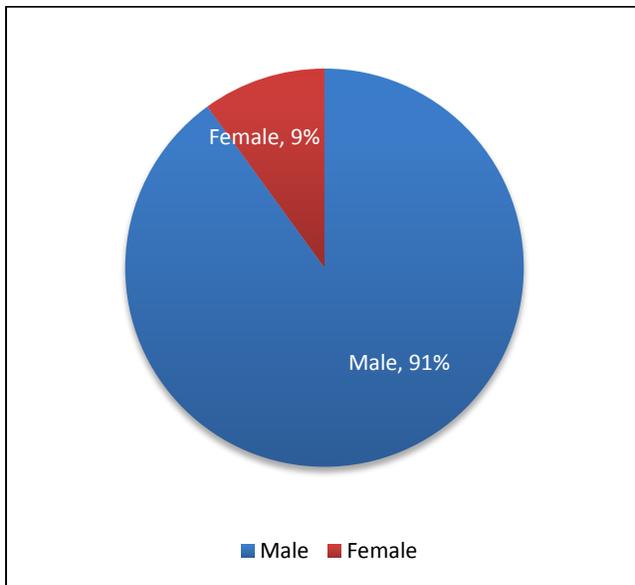
### 3. VETERAN MOBILITY SURVEY

#### 3.1 Survey Design and Administration

The Small Urban & Rural Transit Center (SURTC) designed online and paper surveys to be distributed to veterans. Both surveys contained the same questions targeting veteran travel patterns and mobility issues. A copy of the survey is found in Appendix A. The online survey was distributed via email to Veterans Service Officers (VSO) and Veterans Affairs representatives throughout Minnesota, Montana, and North Dakota. Small urban and rural counties were targeted and the metro area of Minneapolis-St. Paul, MN, was excluded from the survey. Representatives were asked to forward the survey to interested veterans and veteran groups. Paper surveys were distributed during veteran organization meetings and Stand Down events, which are designed to provide services to homeless veterans. A total of 107 online surveys were received while 33 paper surveys were usable, providing a total of 140 viable surveys. A number of other paper surveys were received, but many were only partially completed while others were not completed correctly. Caution should be taken with these results as they are not meant to be replicable, and the answers describe only those persons who responded to the survey. Also, several veterans, when asked in person, refused to complete the survey indicating that they didn't want anyone collecting information pertaining to them. When survey administrators explained that they were not asking for any personal identifying information, apprehensive veterans typically responded: "they have their ways."

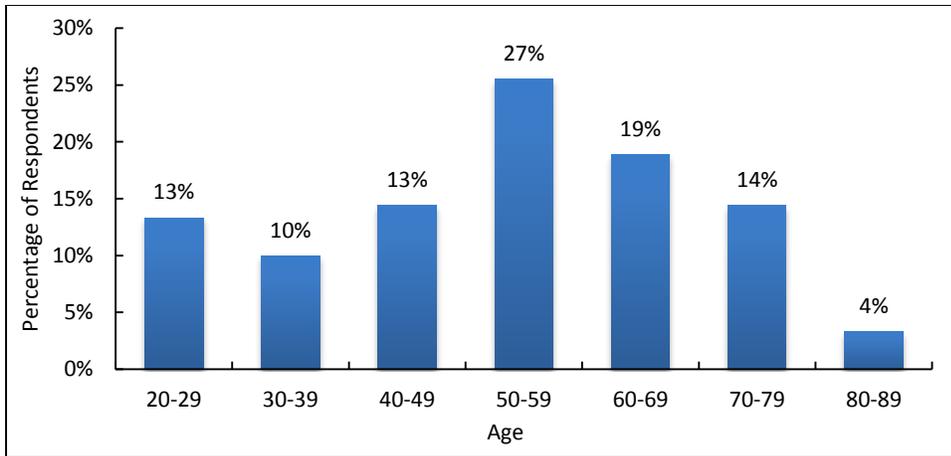
#### 3.2 Profile of Respondents

Survey participants were much more likely to be male (91%) than female (9%). Responses by gender are presented in Figure 3.1.



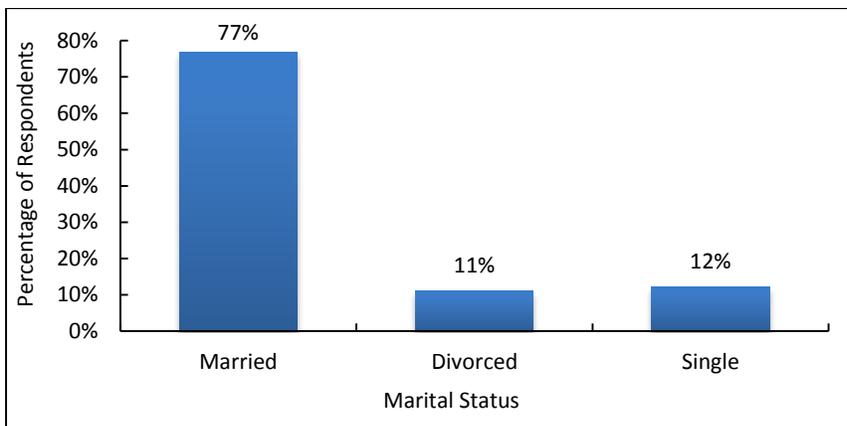
**Figure 3.1** Respondent gender

There was a wide age range among survey respondents (Figure 3.2). The highest percentage of participants, 27%, were between the ages of 50 and 59, and 19% were between the ages of 60 and 69. Thirteen percent of respondents were in their twenties and only 10% were in their thirties. Finally, 4% of participants were more than 80 years old.

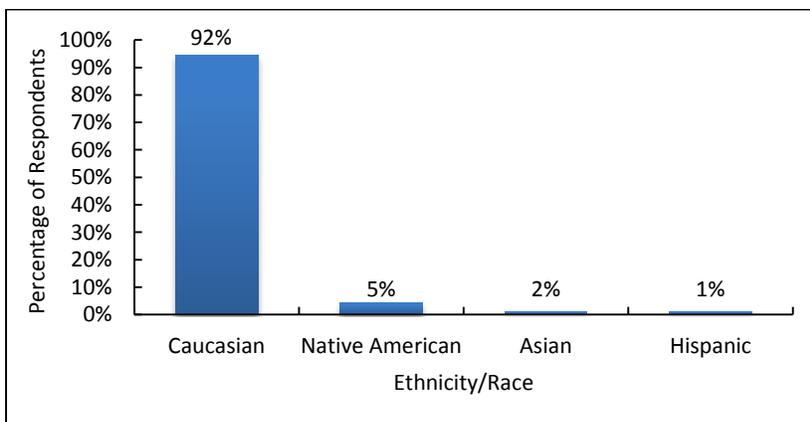


**Figure 3.2** Participant age

The majority of respondents, 77%, reported being married while 11% and 12% were either divorced or single (Figure 3.3). Single was defined as someone who has never been married. Figure 3.4 shows the ethnicity/race of survey participants. The overwhelming majority of respondents, 92%, indicated they were Caucasian, and the remaining 8% reported being Native American, Asian, or Hispanic.

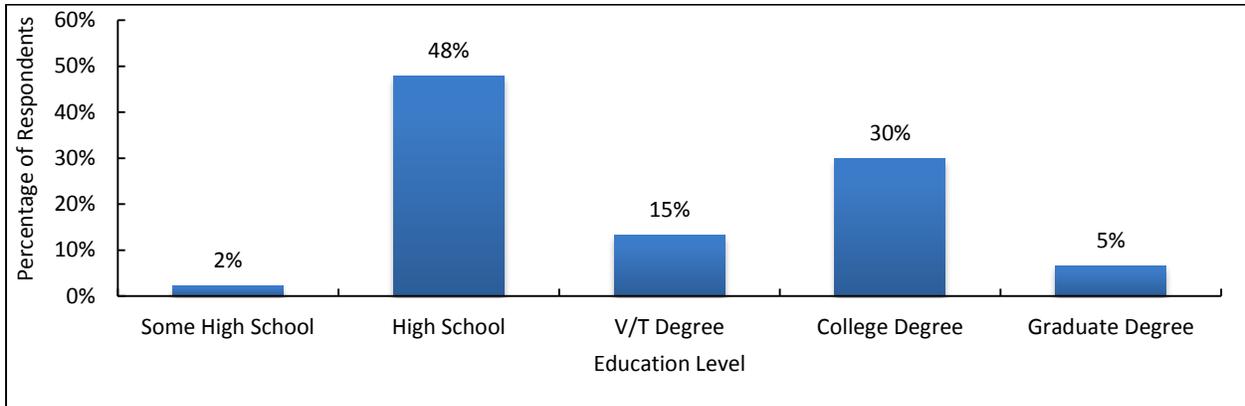


**Figure 3.3** Marital status



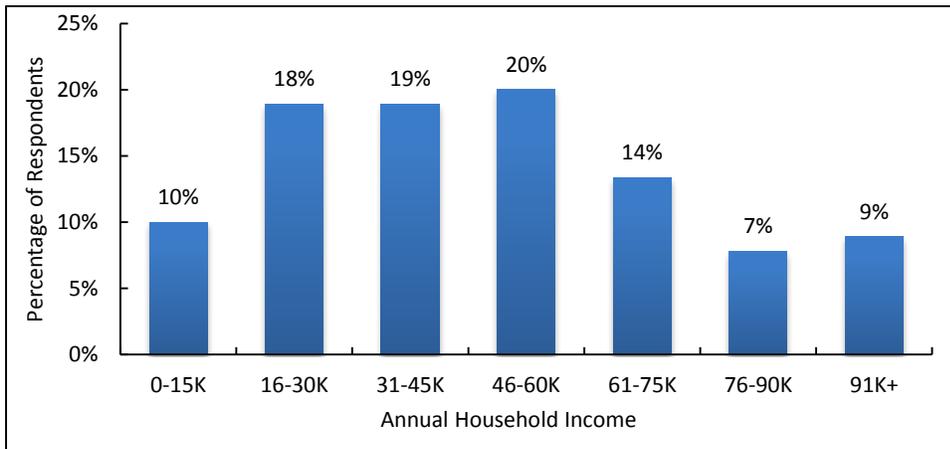
**Figure 3.4** Ethnicity

Veterans were asked to indicate their highest level of education attained. For nearly 50% of respondents, the highest education level obtained was high school graduate, while 15% answered vocational/technical degree, 30% said college degree, and 5% indicated they had a graduate/professional degree. Only 2% of respondents replied that they did not have a high school diploma (Figure 3.5).



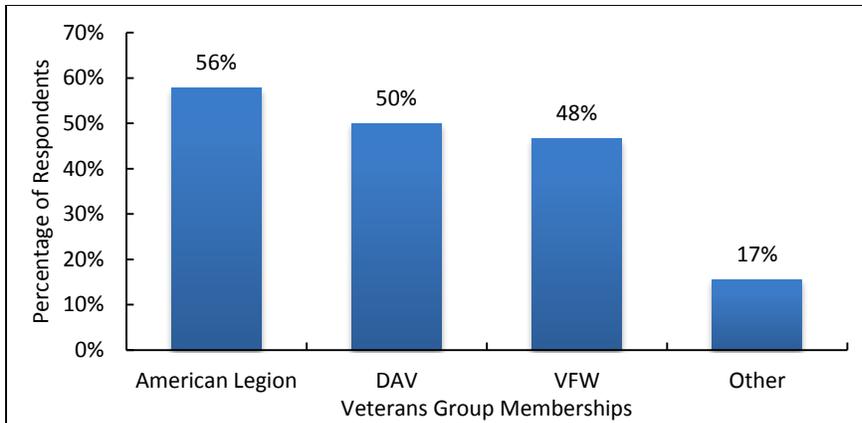
**Figure 3.5** Highest education level attained

Participants indicated a wide range of household incomes. Figure 3.6 shows that nearly 30% of respondents reported their annual household income to be less than \$30,000 while nearly 20% replied that their annual household income was greater than \$75,000. The majority, however, indicated that their annual household income was between \$30,000 and \$75,000.



**Figure 3.6** Annual household income

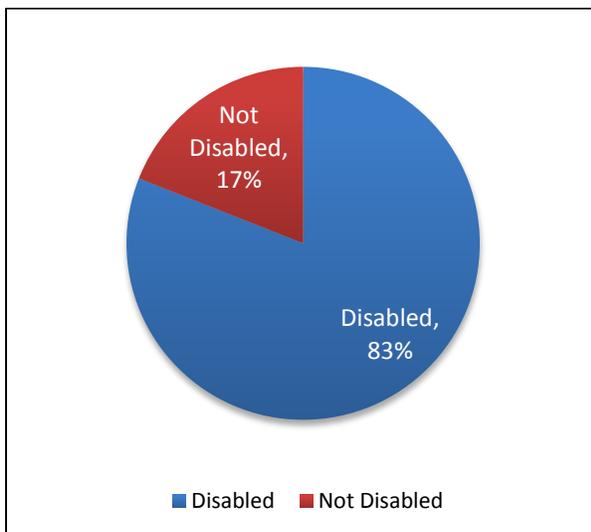
Veterans were asked to indicate with which veterans group(s) they hold membership. This question allowed for multiple selections. Figure 3.7 shows that nearly 60% are members of the American Legion, half are members of the Disabled American Veterans (DAV) and 48% belong to the Veterans of Foreign Wars (VFW). Seventeen percent indicated they belong to another veterans group. These groups included organizations such as AMVETS, Purple Hearts, and the Vietnam Veterans of America (VVA), among others.



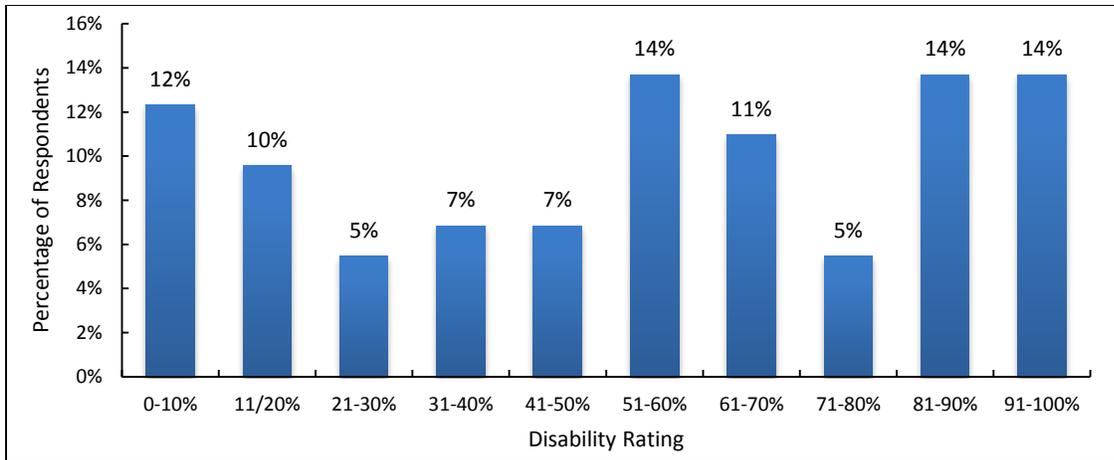
**Figure 3.7** Veteran group membership

### 3.3 Mobility and Travel Patterns

The main section of the survey asked veterans to provide information regarding how and when they traveled to both medical appointments and life essential activities. Initially, they were asked to specify whether or not they were disabled and then indicate their disability rating. Figure 3.8 shows that more than 80% of participants were disabled while disability ratings (Figure 3.9) ranged from 0 to 10% to a 91 to 100% disability rating with a number of respondents representing each disability rating category. In order to qualify and attain a disability rating, a veteran must have a disease or disability diagnosed by a VA medical facility, and it must be service connected, meaning there must be a provable connection between the disability and an incident that occurred while the veteran was in active service (Department of Veteran Affairs 2013).

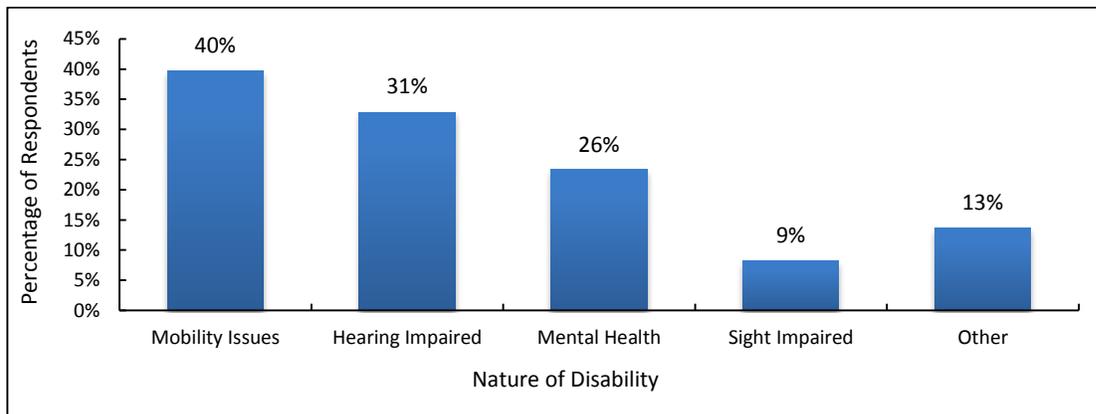


**Figure 3.8** Disabled veterans



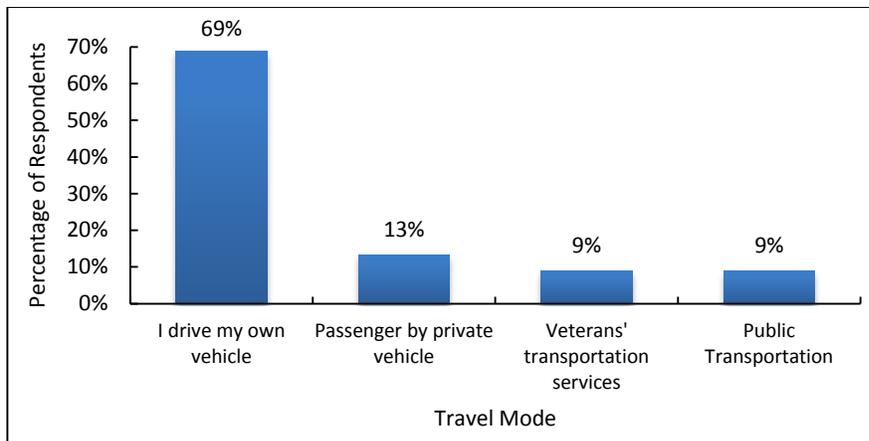
**Figure 3.9** Veteran disability ratings

Respondents were also asked to indicate the nature of their disability. This question also allowed for the identification of more than one disability with many veterans selecting more than one. Forty percent of respondents indicated that they had mobility issues and 31% specified a hearing impairment. Twenty-six percent of participants replied they had a mental health disability and nearly 10% indicated they were sight impaired. Finally, 13% of respondents reported they had some other disability (Figure 3.10).



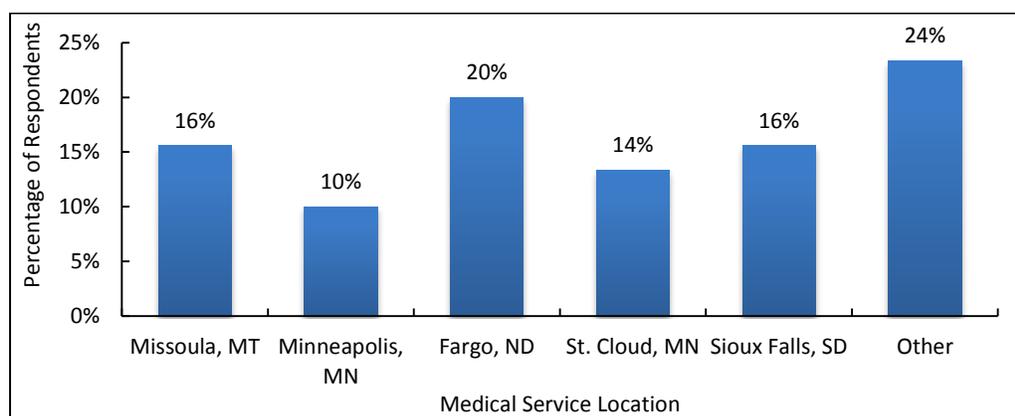
**Figure 3.10** Veteran disabilities

Veterans were then asked a general question about how they usually travel. Nearly 70% indicated they drive their own vehicle and 13% replied that they usually travel as a passenger in a private vehicle. Nine percent of respondents answered that they rely on veteran transportation services and another 9% rely on public transportation for their travel needs (Figure 3.11).



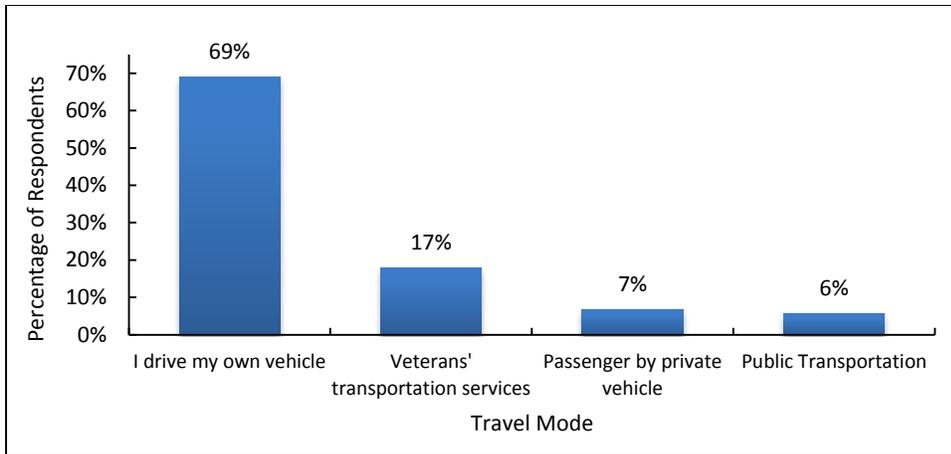
**Figure 3.11** Typical travel modes

A series of travel questions related to medical services followed. First, veterans were asked to indicate where they typically receive veteran medical services. The top five specified veteran health care centers listed were Fargo, ND, Sioux Falls, SD, Missoula, MT, St. Cloud, MN, and Minneapolis, MN (Figure 3.12). More than 75% of the veteran respondents indicated they receive medical treatment at one of these five veteran medical center locations. The other nearly 25% receive medical treatment at other veterans' locations including Mankato, MN, Rochester, MN, and Brainerd, MN, among others.



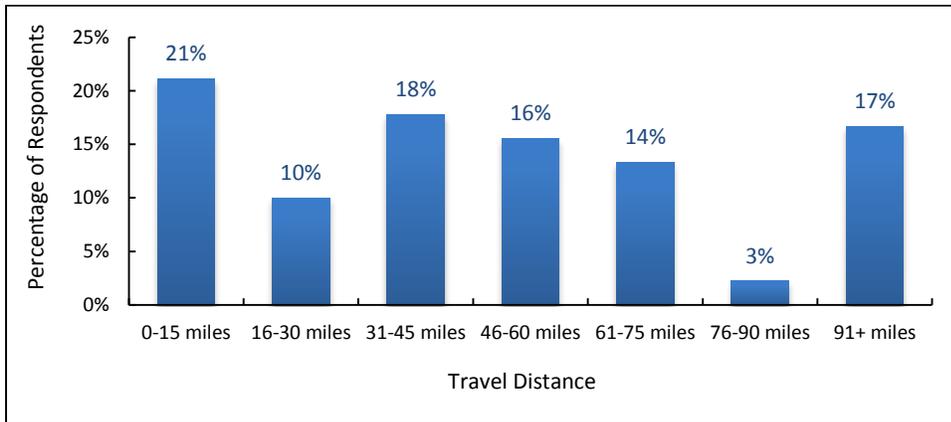
**Figure 3.12** Veteran medical service locations

Next, veterans were asked how they travel to their veteran medical appointments. Almost 70% of veterans indicated they drive themselves to veteran medical appointments while 17% reported they utilize veteran transportation services to travel to medical appointments. Seven percent indicated they travel as a passenger by private vehicle and 6% replied that they use public transportation to access veteran medical services (Figure 3.13).



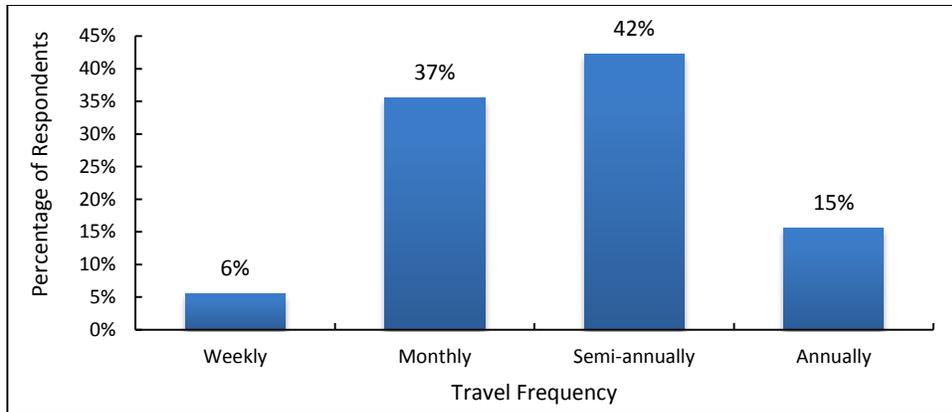
**Figure 3.13** Travel mode to veteran medical appointments

Veterans were also asked how far they are required to travel to get to a veteran health care facility. About one-third of respondents reported that they travel less than 30 miles one way to their veteran health care facility. Another third of respondents indicated they travel between 31 and 60 miles to their veteran health appointments while the final third replied that they travel more than 60 miles one-way to receive medical services (Figure 3.14).



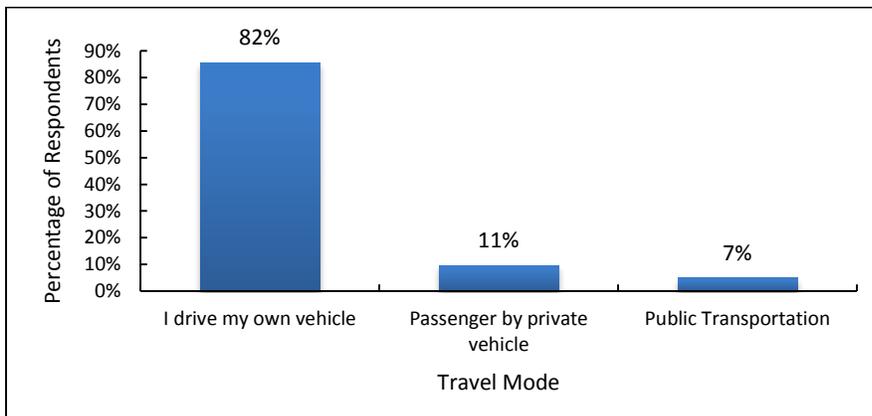
**Figure 3.14** Distance traveled to veteran medical services

Finally, veterans were asked about the frequency with which they travel to their veteran health care facility. Results showed that almost 80% frequent the veteran health care facility either monthly or semi-annually. Six percent indicated they have weekly appointments while 16% have annual veteran health care appointments (Figure 3.15).



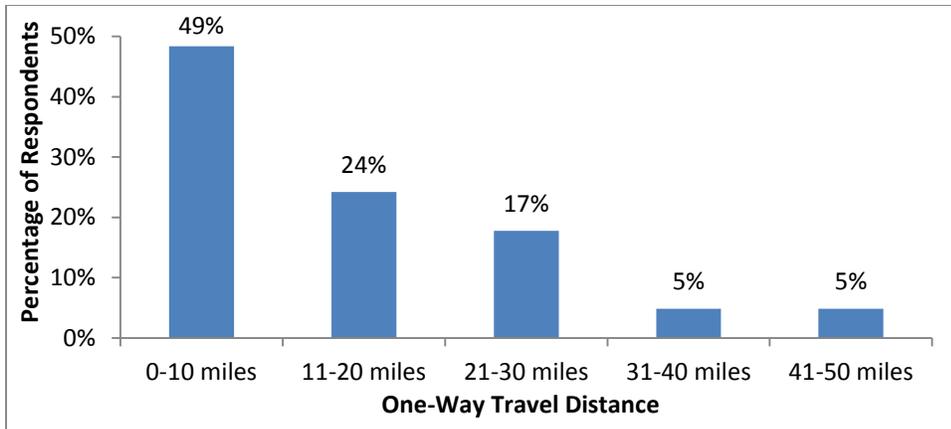
**Figure 3.15** Frequency of veteran health care appointments

The next section of the survey asked veterans a combination of travel questions pertaining to work, essential, and social activities. Initially, veterans were asked if they work outside of their home with 70% of respondents indicating they do. Next, participants were asked how they travel to work. Eighty-two percent responded that they drive their own vehicle while 11% replied that they travel to work as a passenger in a private vehicle. The final 7% indicated they use public transportation to get to work (Figure 3.16).



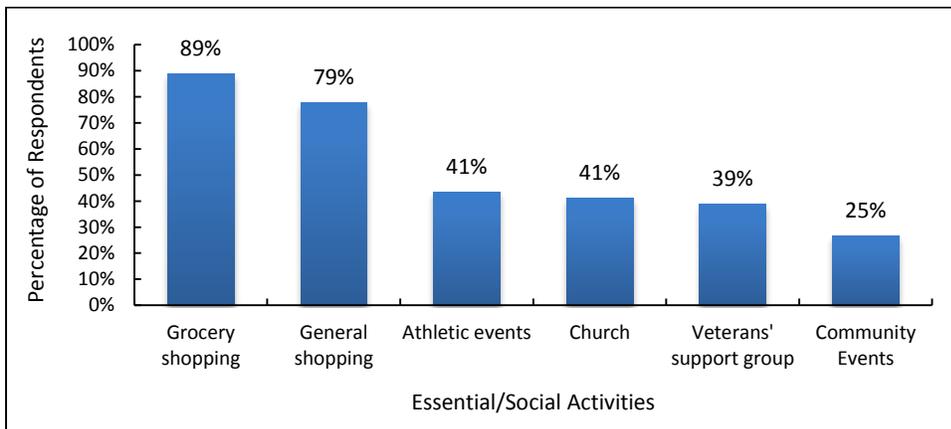
**Figure 3.16** Veteran travel mode to work

Travel distances to work was also requested with nearly half of respondents indicating they travel 10 miles or less, one-way, to work. Twenty-four percent of veterans answered that they travel between 11 and 20 miles to work while 17% indicated they travel between 21 and 30 miles. Finally, 10% of respondents replied that they travel between 31 and 50 miles to work (Figure 3.17).



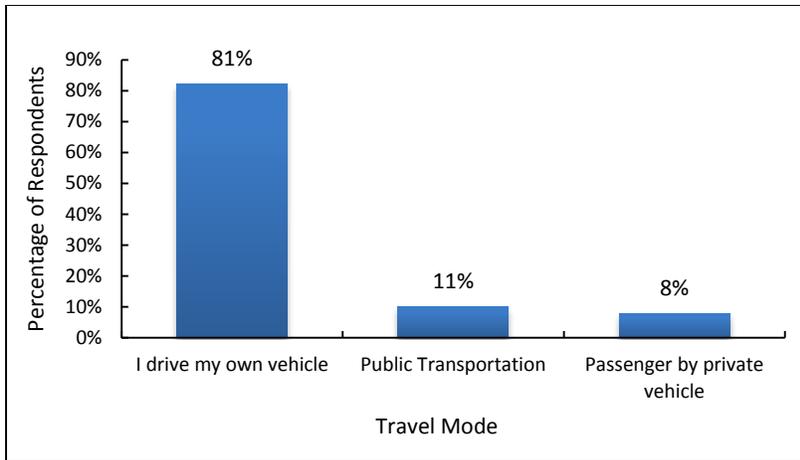
**Figure 3.17** Veteran travel distance to work

Essential and social activities were also considered. This question allowed for more than one activity to be chosen by respondents. Figure 3.18 illustrates the social and essential activities veteran respondents perform with shopping, both grocery and general, as the highest recorded activities at 80 and 90%, respectively. Shopping was followed by athletic events, church, and veteran support groups with all three of these activities receiving a roughly 40% response rate. Community events were indicated as an activity by 25% of veteran respondents as well.



**Figure 3.18** Essential and social activities performed

Finally, veterans were asked how they travel to essential and social activities with 81% indicating they drive their own vehicle (Figure 3.19). Eleven percent answered that they use public transportation and 8% traveled to essential and social activities as passengers by private vehicle. Note that 91% of married veterans indicated that their spouse does not have a mobility issue so it can be assumed that most veterans who travel as a passenger by private vehicle are being driven by their spouses.



**Figure 3.19** Travel mode to essential and social activities

The final section of the survey included an open-ended question asking veterans “What increased transportation services would improve your quality of life?” The most common responses dealt with the need for greater transportation services in rural areas. Many veterans felt that increasing the frequency of service to rural areas was of utmost importance. Some respondents indicated that transit service across county lines would help and allow veterans to utilize neighboring county transit systems that serve larger communities. Veterans that use DAV services commented that they would like vans that are handicap accessible. Timelier Amtrak rail service to Fargo was also mentioned by a few veterans as it currently arrives and departs Fargo between 2 a.m. and 4 a.m. Many veterans, however, indicated that they are satisfied with their current transportation options and that improvements are not necessary.

## 4. SIMULATION OVERVIEW AND RESULTS

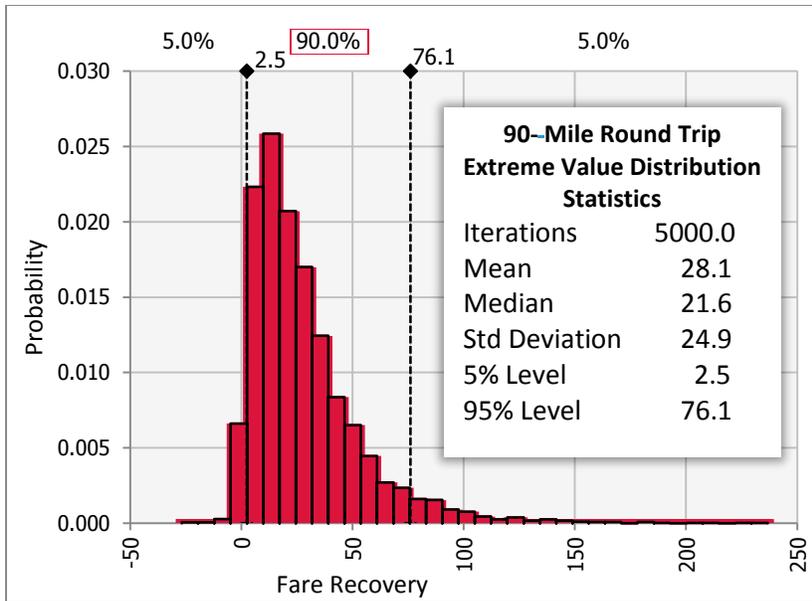
Results from veteran mobility simulations are the focus of this chapter. Simulations were conducted from a transit agency perspective to predict the number of veteran passengers needed for every Veterans Affairs (VA) Health Care Center medical trip so that current fare recovery levels are equaled or surpassed. Simulations were conducted for the states of Minnesota, Montana, and North Dakota as well as transit agencies that serve VA health care centers in Fargo, ND, St. Cloud, MN, Sioux Falls, SD, and Missoula, MT. Sensitivities were conducted focusing on targeted fare recovery levels for the three individual states and the four different VA health care centers as well.

### 4.1 Methodology

Simulations focused on the feasibility of transit agencies coordinating with VA health care centers for veteran medical transportation. Particular attention was paid to the different transportation reimbursement levels associated with each medical trip corresponding to a particular state or health care center. The specific purpose of the simulations was to determine when it would be cost-effective for public transit agencies to transport veterans to VA health care centers. Also, each veteran medical trip was assumed to be unique and dependent on personal preferences and constraints. Therefore, to help account for the uncertainty in travel behaviors, @Risk simulations were conducted. Following is a discussion explaining the function of @Risk and how it can be applied to analyze data variability.

If an individual is confronted with a problem that includes uncertainty, it becomes difficult to use an analytical model that will yield useful results. @Risk, a Microsoft Excel add-in program, contains functions that make it easier to generate observations from random variables. For example, entering RISKNORMAL (5,1) in a cell will generate an observation from a normal random variable with mean 5 and standard deviation 1. Once Microsoft Excel cells that include uncertainty are replaced with @Risk functions, a simulation is run yielding a result that is defined as an output. The purpose of the simulation is to imitate a real-life situation. Within the model, an @Risk cell is simulated a set number of times, called iterations, to provide an output. Results are not exact, but an approximation based on the defined parameters.

@Risk also allows the user to define different probability distributions based on a given dataset. Therefore, decision makers have the option of using various probability distributions that best fit the data being simulated. Some common distributions include logistic, weibull, triangular, normal, and many others. The method of simulation can also be chosen. For this research, Monte Carlo simulations were used. This type of simulation was thought to best represent the circumstances in question. The random number used for each iteration in a Monte Carlo simulation is similar to a spin on the roulette wheel in a casino. Like the spins on the roulette wheel, the random numbers used to generate results within each iteration are independent from one another. A simulation example is shown in Figure 4.1. This figure illustrates the fare recovery for a transit agency in North Dakota after a 90-mile round trip. An extreme value distribution was assigned to the dataset and a mean value of \$28.10 was calculated. This corresponds to a \$297 trip cost for the same trip yielding a fare recovery percentage of 9.5%.



**Figure 4.1** ND fare recovery, 90-mile round trip

The two main variables that represented uncertainty for this research were transit trip cost per mile and fare recovery percentage for all transit agencies. These variables were chosen because they represented two of the most highly considered statistics when an agency is contemplating expanding or reducing service, and they also showed substantial variability within the dataset. Sensitivities involved altering the percentage of fare recovery to show the change in ridership that needed to occur to meet targeted fare recovery levels. The following section will illustrate and define variables used in the simulations.

## 4.2 Data and Definitions

Data used in simulations were collected from a combination of the Rural National Transit Database (RNTD 2011), the Department of Veterans Affairs (2013), and survey findings discussed in Chapter 3. Table 4.1 shows three of the essential variables utilized throughout the simulations. These are the state average operating expense per mile and fare recovery percentage for rural public transit agencies in Minnesota, Montana, and North Dakota. Operating expenses per mile are quite similar between the three states while fare recoveries in Minnesota are more than double those in Montana and nearly twice the North Dakota recovery rate. The relative high Minnesota fare recovery rates are discussed with greater detail in the state simulation section. The VA travel reimbursement of 41.5 cents per mile for health care services is constant for all three states and throughout the country. All simulations assume that veterans would either drive themselves individually to VA medical appointments or they would utilize public transportation. Therefore, each trip that is taken via public transportation would otherwise be reimbursed by the VA at 41.5 cents/mile.

**Table 4.1** Essential Simulation Variables

State	Operating Expense/mile	Fare Recovery	VA Travel Reimbursement
MN	\$3.46	16.1%	41.5 cents/mile
MT	\$2.91	6.7%	41.5 cents/mile
ND	\$3.28	9.4%	41.5 cents/mile

The VA medical travel reimbursement is offered to veterans who meet certain criteria. Veterans may qualify for this benefit if:

- They have a service-connected (SC) disability rating of 30% or more, or
- They are traveling for treatment of a SC condition, or
- They receive a VA pension, or
- Their income does not exceed the maximum annual VA pension rate, or
- They are traveling for a scheduled compensation or pension examination.

Department of Veteran Affairs (2013)

Throughout the past few years, VA beneficiary travel expenses have increased substantially. On Nov. 17, 2008, The VA raised the reimbursement rate Nov. 17, 2008, from 28.5 cents per mile to the current 41.5 cents per mile. Since the rate change, there has been a 76% increase in mileage claims and a 30% increase in the number of veterans claiming travel reimbursements. This has resulted in a doubling of the total beneficiary travel expense in just two years, from \$373 million in fiscal year 2008 to \$745 million in 2010 (Burkhardt et al. 2011).

### 4.3 State Simulation Results

State level scenarios were developed to simulate a coordination effort between rural public transit agencies and VA health care centers. They illustrate that it is feasible to reduce transportation expenditures for the VA while maintaining a manageable cost arrangement for the transit agencies involved. The initial simulation analyzed Minnesota, Montana, and North Dakota rural transit agencies and used the variables in Table 4.2. The simulation was conducted for a 90-mile round trip. This distance was used because it was the average round trip indicated by veteran survey respondents for VA medical trips. Both the operating expense per mile and the fare recovery rate were calculated using @Risk. The distributions used in the calculations included logistic, extreme value, and exponential. Notice how the results are similar to the average values in Table 4.1, but not the same. Other simulations showed much more variability when comparing averages to their @Risk simulation values. The fare recovery was then divided by different VA reimbursement rates ranging from 10 to 40 cents per mile. This reimbursement rate is based on one passenger driving their own personal vehicle so the results show how many passengers a transit agency must transport in order to equal their current fare recovery rate for a given trip. This outcome shows a transit agency the minimum number of passengers that must be transported per trip to equal their current fare recovery level.

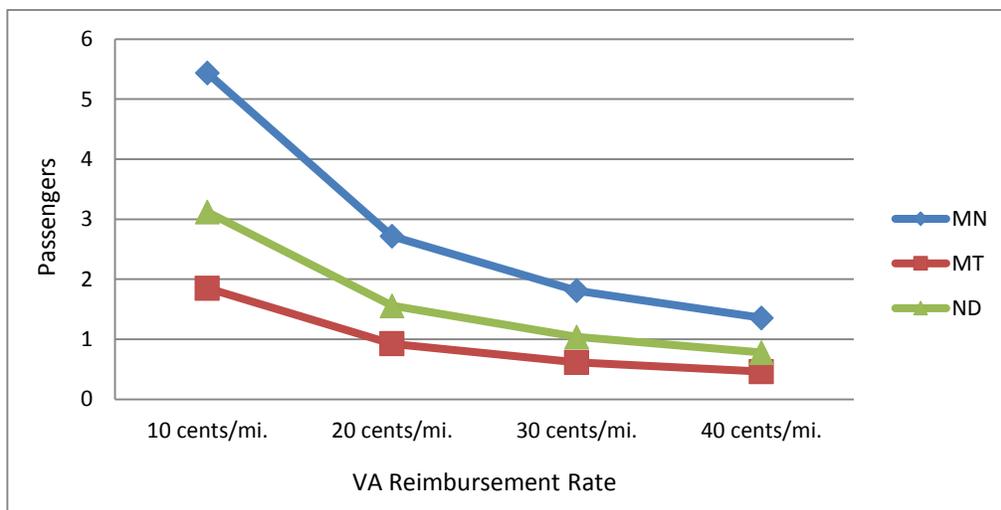
**Table 4.2** State Simulation Variables

State	Trip Mileage	Operating Expense/Mi. @Risk	Total Trip Cost	Fare Recovery @Risk	Total Fare Recovery
MN	90	\$3.40	\$306	15.90%	\$48.91
MT	90	\$2.86	\$257	6.40%	\$16.64
ND	90	\$3.29	\$297	9.50%	\$28.07

Note that all of the discussion in this chapter related to the number of passengers per trip is rounded up to the next whole number even though the exact results may show fractions of passengers. Whole numbers are used because all results need to meet or exceed the estimates to cover fare recovery rates and each passenger represents one person who cannot be divided. Thus, Figure 4.2 shows that with a VA reimbursement rate of 10 cents per mile, transit agencies in Minnesota must transport six passengers to exceed their current fare recovery level while Montana and North Dakota need to only transport two and three passengers, respectively. This is due to the higher fare recovery level in Minnesota compared to the other two states. Also, all of the point values shown throughout this chapter represent the mean values estimated.

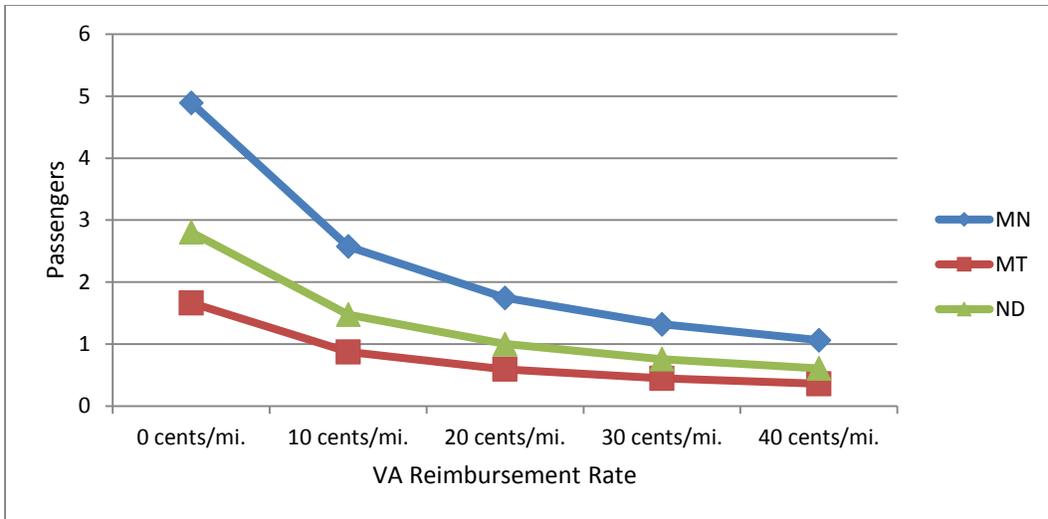
There are confidence intervals representing each estimation that account for the uncertainties related to operating expenses and fare recovery rates.

As the VA reimbursement rate increases, fewer passengers must be transported per trip to surpass current fare recovery levels. Also, the simulation results shown in Figure 4.2 and most of the region-specific simulations included no fare charged to the passenger by the transit agency. That's because getting potential riders to leave their personal vehicle at home and ride the bus would be difficult enough; charging a direct fare for a ride may hinder potential riders from choosing to utilize the service. Also, all of the VA reimbursement levels for the simulations were set to less than the current 41.5 cents per mile reimbursement rate for beneficiary travel used for VA medical travel. Therefore, if rural public transit agencies and VA Medical Care Centers coordinated their travel, and if transit agencies can meet or exceed the ridership numbers yielded by the simulations, they will equal or improve on their current fare recovery rates and VA travel reimbursement payments will drop as well.



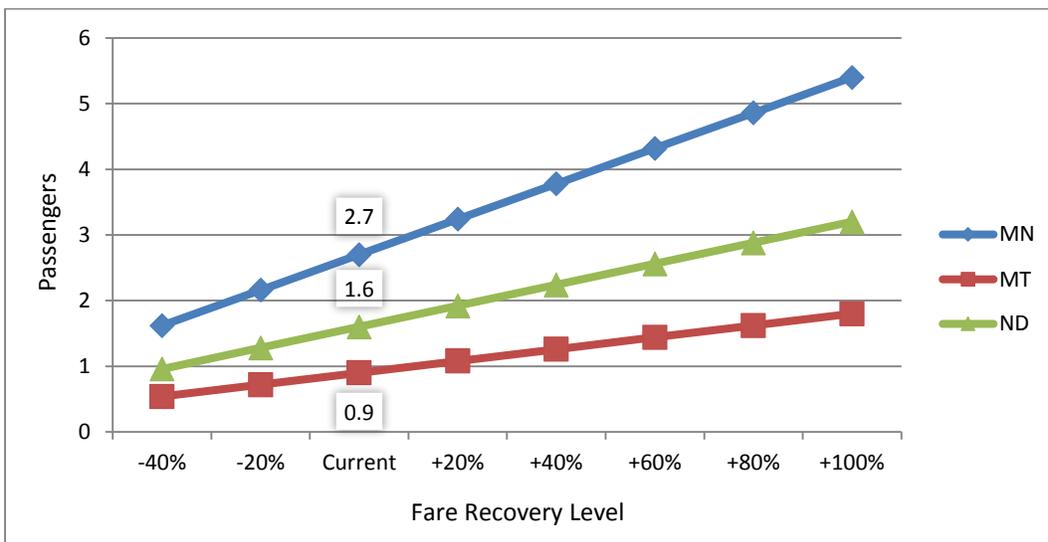
**Figure 4.2** State level simulations, 90-mile round trip

Figure 4.3 illustrates the passengers needed to meet current fare recovery levels including a \$10 fare for the 90-mile trip charged by the transit agency. This fare is consistent with current fares offered by rural agencies in the three state area. Also, the initial results show the number of passengers needed utilizing the \$10 fare but with no reimbursement from the VA Medical Health Center. This differs from Figure 4.2 as no result could be calculated for that simulation without including some fare or reimbursement level. These simulations show that with a 10 cent per mile VA reimbursement, transit agencies in the three states need to transport between one and three passengers per 90-mile round trip to equal or surpass their current fare recovery levels. When no VA reimbursement is included, but passengers are still charged the \$10 fare, agencies must transport between two and five passengers per round trip to equal or surpass the same fare recovery levels.



**Figure 4.3** State level simulations, 90-mile round trip including a \$10 transit fare

Figure 4.4 shows state level transit ridership needed to meet different fare recovery levels. Current levels for each state are indicated with actual values within the figure. This simulation assumed a 20 cent per mile VA travel reimbursement with no transit fare. To equal the current fare recovery levels, the states simulated must transport between one and three passengers per trip, but in order to double their current fare recovery, transit agencies must transport six passengers in Minnesota and between two and four passengers in Montana and North Dakota.

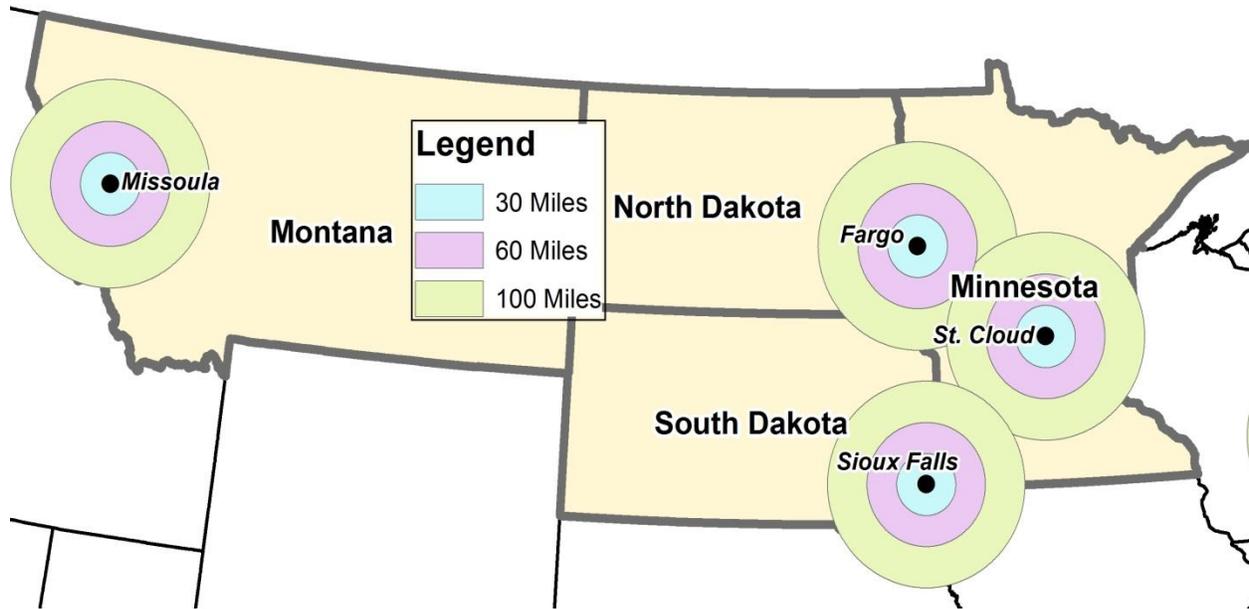


**Figure 4.4** State level simulations, 90-mile round trip, 20 cent per mile VA reimbursement

#### 4.4 VA Health Care Center Simulation Results

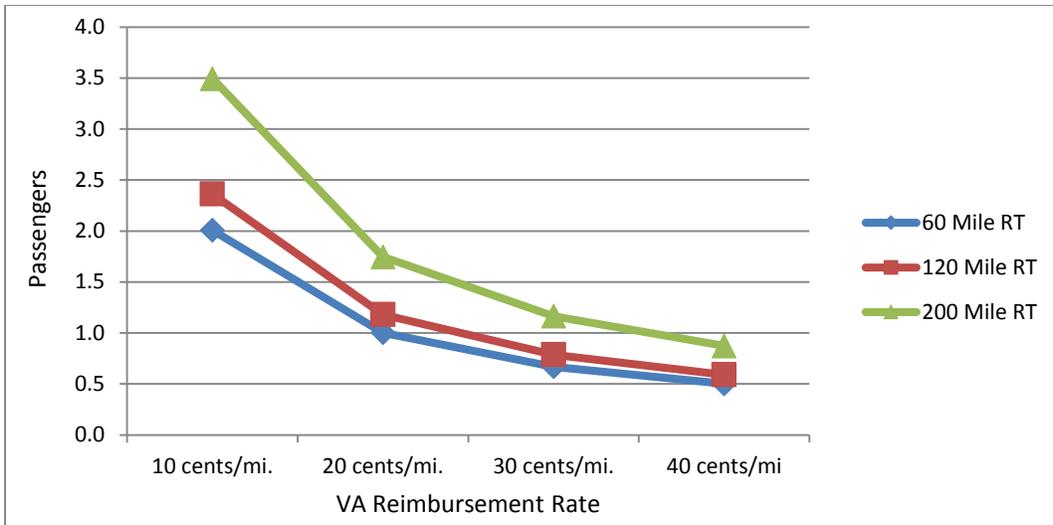
VA Health Care Center regional scenarios were developed to simulate coordination efforts for rural public transit agencies who could potentially serve regional VA health care centers. Figure 4.5 illustrates the four regional veteran health care markets analyzed including Fargo, ND, St. Cloud, MN, Sioux Falls, SD, and Missoula, MT. All four locations were chosen because nearly 70% of survey respondents indicated that they receive veteran medical care at one of these veteran health care centers. Also, coordinated travel simulations between VA health care centers and rural public transit agencies were

completed at three different mile radiuses from each VA health care center as seen in Figure 4.5. The market radiuses were set at 30, 60, and 100 miles from each center, which corresponded with survey results. Veteran responses showed that roughly one-third travel 30 miles or less one-way to receive veteran health care services, another third travel between 30 and 60 miles one-way while the remaining third travel between 60 and 100 plus miles to receive veteran medical treatment. Rural public transit agencies that provide service within the given radiuses were used in simulations. Notice that there is also an overlap within the travel regions of Fargo, ND, St. Cloud, MN, and Sioux Falls, SD, at the 100-mile radius level. Because of this, simulations allowed the same transit agency to serve more than one veteran health care center if their location fell within the service region of more than one center.



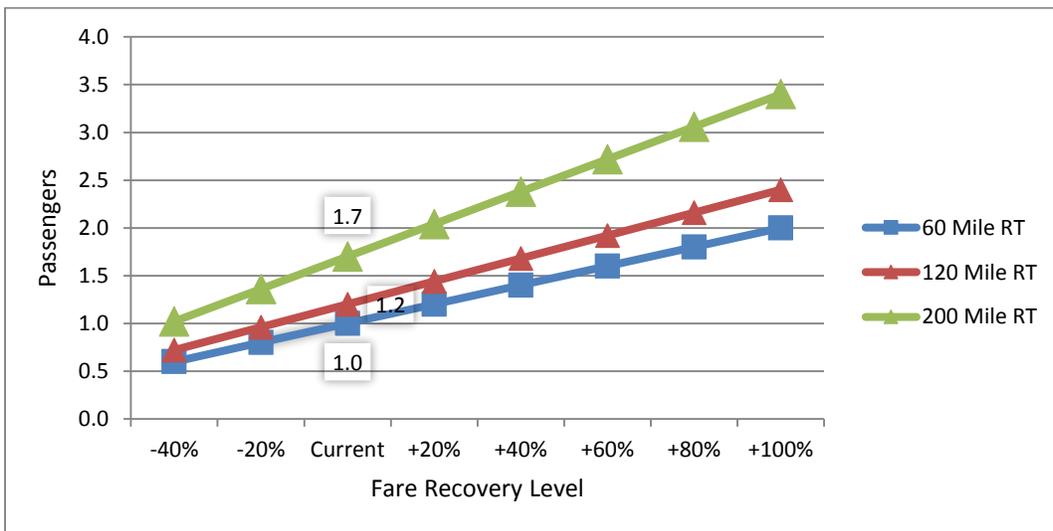
**Figure 4.5** VA health care center travel regions simulated

Figure 4.6 shows simulation results for the Fargo, ND, VA Health Care Center service region. These simulations assume that no fare was charged by the transit agency providing service to the health care center. The 60-mile round trip simulation showed that two passengers would need to be transported to equal current transit fare recovery rates with a VA reimbursement of 10 cents per mile while three and four passengers would be required to cover the fare recovery rate for the 120- and 200-mile round trips, respectively. Obviously, the number of passengers required to cover the fare recovery declines as the VA reimbursement rate increases. More passengers were required to meet fare recovery levels for the longer trips as the 200-mile trip had a fare recovery percentage of more than 12% while the other two trips had fare recovery rates between 8% and 9%. This was because the transit agencies serving the outer range of the service area have high fare recovery rates compared to those serving the area closer to the Fargo, ND, VA Health Care Center.



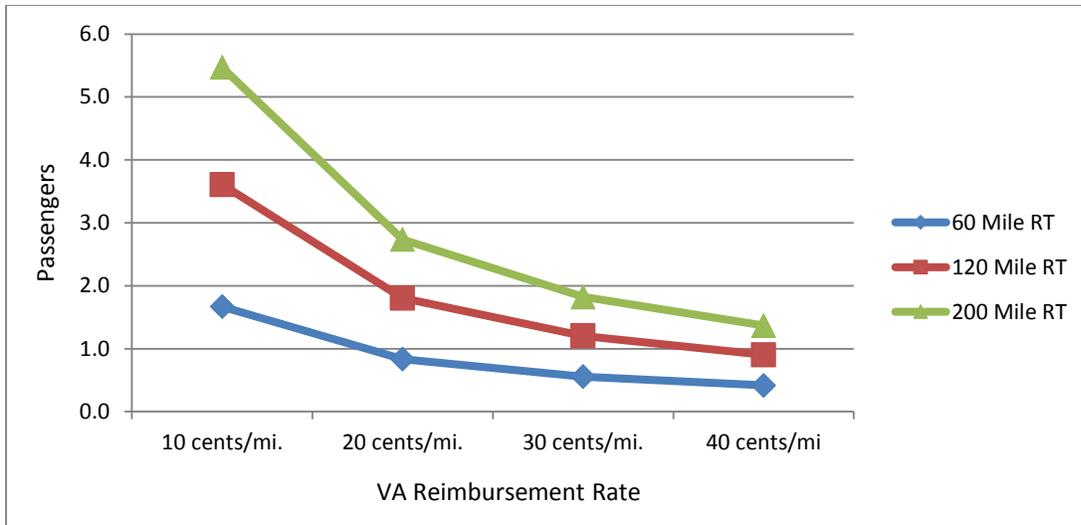
**Figure 4.6** Fargo, ND, veteran health care simulations

Figure 4.7 shows the Fargo, ND, regional ridership needed to meet different fare recovery levels. Current ridership levels for each trip length are shown within the figure. These simulations, like the state level simulations, assumed a 20 cent per mile VA travel reimbursement with no transit fare charged. To equal the current transit recovery rate, agencies must average between one and two passengers for the different trip lengths simulated. To double their current fare recovery levels they must transport two passengers for each 60-mile round trip and four passengers for each 200-mile round trip.



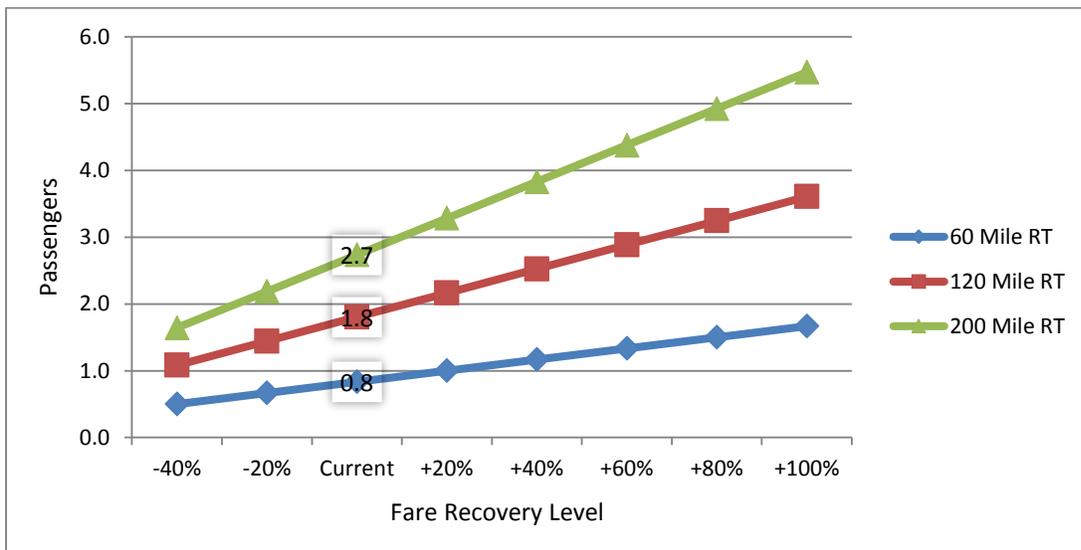
**Figure 4.7** Fargo, ND, simulations, 20 cent per mile VA reimbursement

Figure 4.8 displays simulation results for the St. Cloud, MN, Veteran Health Care Center service region. Assuming that no fare was charged by the transit agency, the 60-mile round trip resulted in only two passengers required to meet current fare recovery levels while six passengers were needed to meet fare recovery levels for the 200-mile round trip. This was a result of a 7% fare recovery rate for transit agencies within 30 miles of St. Cloud and a 16% recovery rate for agencies within the 100-mile service radius.



**Figure 4.8** St. Cloud, MN, veteran health care simulations

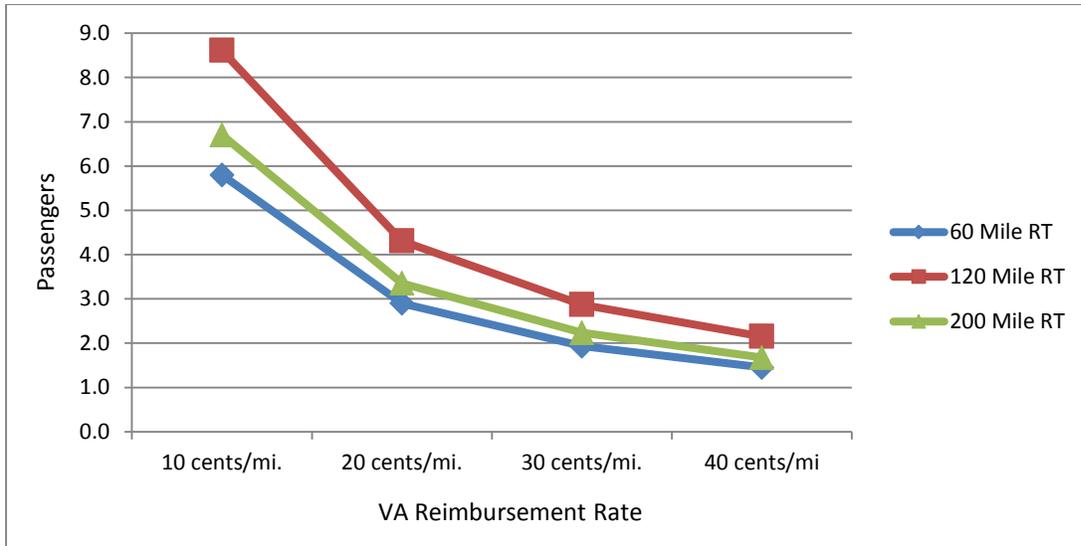
Figure 4.9 shows the St. Cloud, MN, regional transit ridership necessary to meet fare recovery levels. Once again, the longer trips require greater ridership because those agencies serving that area had higher fare recovery rates. Three passengers were necessary to equal current fare recovery levels for the 200-mile trip while only one passenger was needed for the shorter 60-mile round trip. Also, to double the current fare recovery rate, the 200-mile round trip would require six passengers and the 60-mile trip would only need two passengers to double current fare recovery rates.



**Figure 4.9** St. Cloud, MN, simulations, 20 cent per mile VA reimbursement

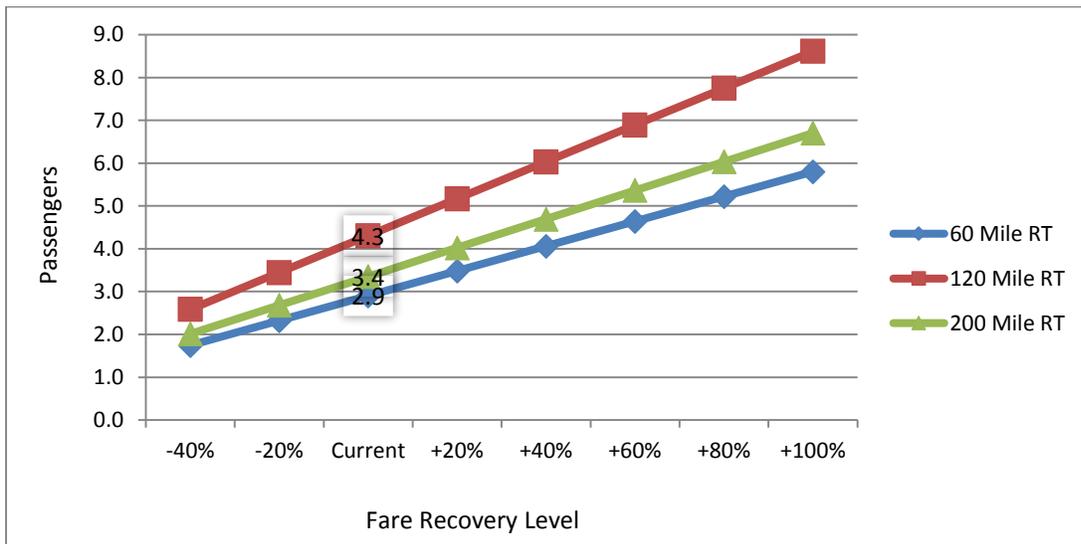
Figure 4.10 illustrates simulation results for the Sioux Falls, SD, Veteran Health Care service region. While the Fargo, ND, and St. Cloud, MN, regions showed similar results, the Sioux Falls regional simulations yielded less predictable outcomes. For example, the 120-mile round trips serving the Sioux Falls Veteran Medical Center had higher fare recovery levels compared to the 60- and 200-mile round trips which had similar fare recovery levels. Also, because the fare recovery levels within the Sioux Falls region were higher compared to those in Fargo, ND, and St. Cloud, MN, between 14 and 19%, the VA reimbursement rate had a greater impact on ridership levels. Assuming a 10 cent per mile VA travel reimbursement, between six and nine passengers per transit trip was needed to meet current fare recovery

levels, but when the VA reimbursement level was increased to 40 cents per mile, the ridership required to meet the higher levels dropped to between two and three passengers per trip for all three different length trips.



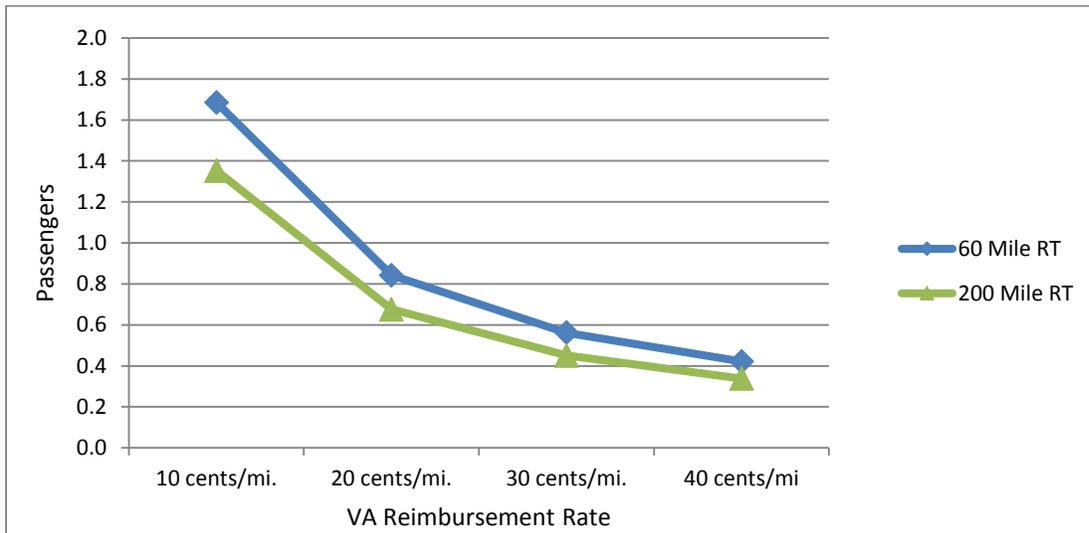
**Figure 4.10** Sioux Falls, SD, veteran health care simulations

Figure 4.11 displays the simulation results for the transit ridership needed to meet different fare recovery levels for the Sioux Falls, SD, region at the three different trip lengths. Like the previous results, the 120-mile round trip had a higher fare recovery level than the other two and required a greater number of passengers to meet or exceed current levels. Also, in order to double the current fare recovery level within this region, transit agencies would need to average between six and nine passengers for each trip serving the Sioux Falls, SD, VA Health Care Center for all three trip lengths.

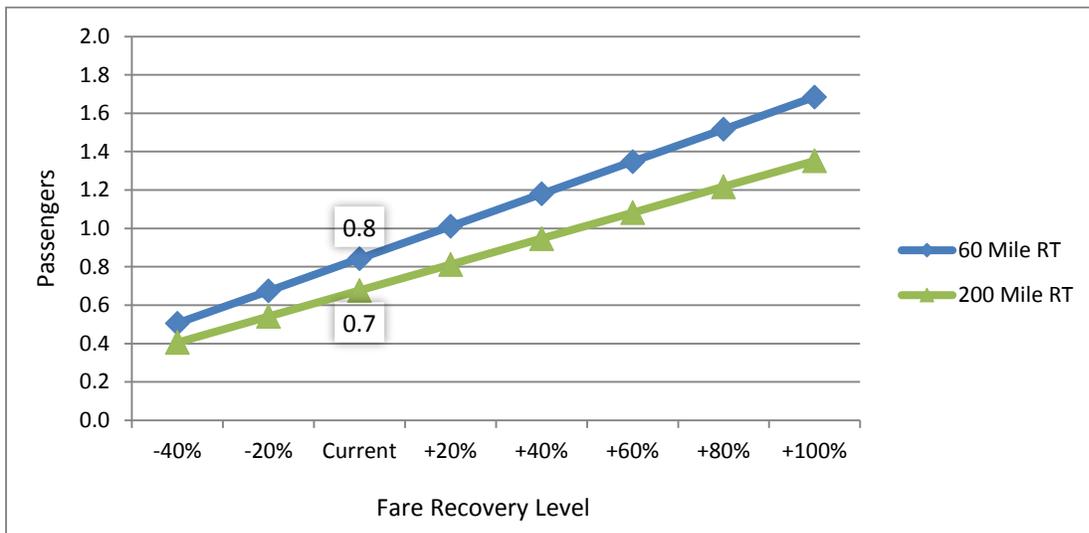


**Figure 4.11** Sioux Falls, SD simulations, 20 cent per mile VA reimbursement

Figures 4.12 and 4.13 show simulation results for the Missoula, MT, Veteran Health Care service region. Because of the very low fare recovery rates and operating expenses in this region compared to the three other regions, the number of passengers needed per rural transit veteran medical trip was between one and two passengers for all simulations. The current fare level simulation showed that only one passenger must be transported to exceed current fare recovery rates for both the 60- and 200-mile round trip. Operating expenses per mile ranged from one to three dollars for most transit agencies serving this region while fare recovery rates were less than five percent for 70% of the area agencies as well. Also, 120-mile round trip simulations were not included for this region as sufficient data for that trip length was not available.



**Figure 4.12** Missoula, MT veteran health care simulations



**Figure 4.13** Missoula, MT simulations, 20 cent per mile VA reimbursement

## 4.5 Summary

The main objective of the simulations in this chapter was to determine the feasibility of a potential coordination effort between VA health care centers and rural public transit agencies while transporting military veterans for VA health care appointments. At current fare recovery levels, with a 20 cent per mile VA reimbursement, the three states considered would need to transport between one and three passengers to VA medical appointments per trip. Using the same simulation parameters for the four individual markets in the study resulted in the need to transport between one and five passengers to satisfy current fare recovery levels. Also, without any VA travel reimbursement, between two and five passengers would need to be transported at the state level. Transporting veterans for medical trips within the Missoula, MT, region was much less costly compared to other regions due to a combination of both low per-mile operating costs and fare recovery rates.

Predictably, simulations showed that when high per-mile operating costs were combined with volatile fare recovery rates, results were much more unpredictable than when low per-mile operating costs were combined with volatile fare recovery rates. However, both low and high operating costs combined with less volatile fare recovery rates yielded predictable results. Therefore, only the combination of high per-mile operating costs and volatile fare recovery rates magnified the unpredictability of the simulation models. Overall, the volatility of results was lessened by the ability to properly match distributions to datasets by using the @Risk simulation modeling method.

## 5. SUMMARY AND CONCLUSIONS

One objective of this study was to identify veterans with mobility needs currently living in rural Minnesota, Montana, and North Dakota. The cost of feasible transportation options was quantified in relation to meeting veteran medical needs. Survey results of 140 military veterans indicated that the majority were male, middle to late middle aged, married, and Caucasian. About 50% of survey respondents had attained an education level beyond high school, and half had a household income above \$45,000 per year.

More than 80% of veteran respondents classified themselves as disabled with nearly three-fourths of these indicating that their veteran disability rating is greater than 30%. In order to qualify for VA beneficiary travel benefits for medical appointments, a veteran must have a disability rating greater than 30%. Thus, all of these veterans qualify for the benefit. The most common disability that survey respondents reported having was mobility impairment, followed by hearing impairment and mental health issues. With the high level of disability and the various issues indicated by respondents, driving may be a challenge for many rural veterans. However, between 70 and 85% of respondents indicated they either drive themselves to medical appointments, work, or both. Work trips, on average, however, were much shorter than VA medical appointment trips.

A second objective was to determine the costs of feasible transportation options in relation to meeting veteran medical needs. When simulating a coordination effort between VA medical health care centers and rural public transit agencies, results varied by state and region because of varying operating costs and fare recovery rates while the VA beneficiary travel reimbursement remained constant at 41.5 cents per mile. Minnesota simulations had the highest fare recovery rate compared to Montana and North Dakota, and simulated veteran medical trips serving the Sioux Falls, SD, Veteran Health Care Center had the highest cost per mile and fare recovery rate compared to other regional VA health care centers in Fargo, ND, St. Cloud, MN, and Missoula, MT.

The region served by the Missoula, MT, Veteran Health Care Center had by far the lowest costs for both operating and fare recovery compared to the other three VA health care regions. By including a 10 to 20 cent per mile VA reimbursement for medical travel, most state and regional transit agency simulations required ridership of between two and five passengers per trip to meet or exceed current fare recovery levels. At the state level, when a \$10 transit fare was also charged, ridership necessary to meet fare recovery levels dropped to between one and three passengers per trip.

Most simulations indicated that a coordination effort between VA health care centers and rural public transit agencies would be feasible if estimated ridership levels could be attained. Policies that would encourage such coordination should be considered to maximize veteran travel benefits while lowering the cost of providing overall veteran medical transportation services. The real difficulty, however, will be in getting rural veterans, being primarily middle to late middle age, and who have driven their own vehicles for 30 to 50 plus years to consider public transit as a feasible transportation alternative to reach VA medical appointments.

## REFERENCES

- All the Way Home. (2013). "All the Way Home Conference IV." All the Way Home: The Tri-State Veterans Organization. Dubuque, IA.
- American Community Survey. (2010). "2010 American Community Survey." U.S. Census Department. Retrieved August 2013 from <http://www.census.gov/acs/>
- Burkhardt, Jon E., Joseph M. Rubino, & Joohee Yum. (2011). *TCRP Research Digest 99: Improving Mobility for Veterans*. Transit Cooperative Research Program. Washington D.C.: Transportation Research Board of the National Academies. April 2011.
- Department of Veterans Affairs. (2013). "Veteran Population Projections: FY2010 to FY 2040." U.S. Department of Veterans Affairs. Washington D.C.
- Disabled American Veterans. (2012). *DAV Annual Report 2012*. Disabled American Veterans. Cold Spring, KY.
- Federal Transit Administration. (2012). "VTCLI Project Selections 2012." Retrieved September 2013 from [http://www.fta.dot.gov/grants/sitemap\\_14723.html](http://www.fta.dot.gov/grants/sitemap_14723.html)
- MCOTA. (2013). *Minnesota Council on Transportation Access 2013 Annual Report*. Minnesota Council on Transportation Access.
- Minnesota Statutes. (2013). "174.24 Public Transit Participation Program." The Office of the Revisor of Statutes, St. Paul, MN.
- National Center of Veteran Analysis and Statistics. (2012). *Characteristics of Rural Veterans*. U.S. Department of Veterans Affairs. Washington D.C.
- North Dakota Department of Veterans Affairs. (2013). State Benefits: Transportation System. Retrieved September 2013 from <http://www.nd.gov/veterans/travel/veterans.html>
- North Dakota Office of State Treasurer. (2013). "Veterans Post War Trust Fund." State of North Dakota, Bismarck, ND.
- NRC. (2011). *Transportation for America's Veterans and Their Families*. National Resource Center for Human Service Transportation Coordination. Washington D.C.
- Office of Public and Intergovernmental Affairs. (2013). "VA Grants Will Expand Transportation in Highly Rural Areas." U.S. Department of Veterans Affairs. Washington D.C.
- Rall, Jaime & Alice Wheet. (2013). *A Mission to Serve: State Activities to Help Military Veterans Access Transportation*. The National Conference of State Legislatures. Washington D.C. January 2013.
- Schmidt, Helmut. (2013). "More Telemedicine for vets: Fargo VA Reaching More Veterans in Rural Areas." *The Fargo Forum*. May 27, 2013.
- RNTD (2011). *Rural National Transit Database*. Federal Transit Administration. <http://www.ntdprogram.gov/ntdprogram/>

Uken, Cindy. (2011). "VA Vans, Program Equips Veterans with Additional Transportation Options." *The Billings Gazette* August 7, 2011.

Walsh, M.J., 2010, Annual Report, 89<sup>th</sup> National Convention of the Disabled American Veterans, Atlanta, GA.

## APPENDIX A

### Veteran Mobility Survey

- 1) Are you a disabled veteran? (If you check No, skip to question 4)
  - Yes
  - No
  
- 2) If Yes, what is the nature of your disability and what mobility device, if any, do you use? (select all that apply)
  - Scooter
  - Walker
  - Wheelchair
  - Cognitive Disability
  - Service Animal
  - Mental Health
  - Hearing Impaired
  - Sight Impaired
  - Other \_\_\_\_\_
  
- 3) If Yes, what is your disability rating?

<input type="checkbox"/> 0-10%	<input type="checkbox"/> 51-60%
<input type="checkbox"/> 11-20%	<input type="checkbox"/> 61-70%
<input type="checkbox"/> 21-30%	<input type="checkbox"/> 71-80%
<input type="checkbox"/> 31-40%	<input type="checkbox"/> 81-90%
<input type="checkbox"/> 41-50%	<input type="checkbox"/> 91-100%
  
- 4) Are you a member of a veterans' group? (select all that apply)
  - D.A.V.
  - V.F.W.
  - Purple Hearts
  - American Legion
  - Other \_\_\_\_\_
  
- 5) How do you usually travel?
  - I drive my own vehicle
  - As a passenger by private vehicle (civilian driver)
  - As a passenger by private vehicle (veteran driver)
  - Public transportation (Fixed-route)
  - Public transportation (Dial-a-ride, Paratransit)
  - DAV transportation
  - Veterans' transportation services
  - Other veterans' transportation
  - Volunteer driving service

6) Where do you typically receive Veterans medical services?

City\_\_\_\_\_ State\_\_\_\_\_

7) How far do you travel to your Veterans Hospital or Veterans Clinic?

- 0-15 miles
- 16-30 miles
- 31-45 miles
- 46-60 miles
- 61-75 miles
- 76-90 miles
- 91+ miles

8) How do you usually travel to a Veterans Hospital or Veterans Clinic?

- I drive my own vehicle
- As a passenger by private vehicle (civilian driver)
- As a passenger by private vehicle (veteran driver)
- Public transportation (Dial-a-ride, Paratransit)
- DAV transportation
- Veterans' transportation services
- Other veterans' transportation
- Volunteer driving service

Other\_\_\_\_\_

9) How often do you travel to a Veterans Hospital or Veterans Clinic?

- Daily
- Weekly
- Monthly
- Semi annually
- Annually

10) Do you currently work outside your home?

- Yes
- No

11) If yes, how do you usually travel to work?

- I drive my own vehicle
- As a passenger by private vehicle (family member driver)
- As a passenger by private vehicle (co-worker driver)
- Public transportation (Fixed-route)
- Public transportation (Dial-a-ride, Paratransit)
- Volunteer driving service
- Other\_\_\_\_\_

- 12) How far do you travel to work? (One way)
- 0-10 miles
  - 11-20 miles
  - 21-30 miles
  - 31-40 miles
  - 41-50 miles
  - 51-60 miles
  - 61+ miles
- 13) What essential and social activities do you perform or attend? (select all that apply)
- Grocery shopping
  - General shopping
  - Community/senior center activities
  - Veteran support group
  - Church
  - Athletic events
  - Community events
- Other \_\_\_\_\_
- 14) How do you usually travel to essential/social activities?
- I drive my own vehicle
  - As a passenger by private vehicle
  - Public transportation (Fixed-route)
  - Public transportation (Dial-a-ride, Paratransit)
  - Volunteer driving service
- Other \_\_\_\_\_
- 15) What is your highest education level attained?
- Some High School
  - High School
  - Some College
  - Vocational/Technical Degree
  - College Degree
  - Graduate Degree
- 16) What is your annual household income?
- 0 - \$15,000
  - \$16,000 – 30,000
  - \$31,000 – 45,000
  - \$46,000 – 60,000
  - \$61,000 - 75,000
  - \$76,000 – 90,000
  - \$91,000+

- 17) Is your household a:  
 One income household  
 Two income household
- 18) What is your ethnicity/race?  
 African descent  
 Asian  
 Caucasian  
 Hispanic/Latino  
 Native American  
Other\_\_\_\_\_
- 19) What is your current occupation/job?  
\_\_\_\_\_
- 20) What is your marital status?  
 Married  
 Divorced  
 Widowed  
 Single
- 21) If married, is your household comprised of:  
 One vehicle  
 Two vehicles  
Other\_\_\_\_\_
- 22) If married, does your spouse have difficulty with transportation issues?  
 Yes  
 No  
If Yes, please explain\_\_\_\_\_
- 23) What is your gender?  
 Male  
 Female
- 24) Please select your age range:  
 20-29       60-69  
 30-39       70-79  
 40-49       80-89  
 50-59       90+
- 25) What is your current city of residence?  
City\_\_\_\_\_ State\_\_\_\_\_

26) What increased transportation services would improve your quality of life? (Open-ended)