

SURTC



RESEARCH DIGEST

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CONTENTS

Message from the Editor2

Ride or Relocate3

Intercity Travel Demand in Rural Areas.....6

Technology Adoption by Small Urban and Rural Transit Agencies10

Public Transportation Workforce Development: A Survey of Vocational and
University Students..... 13

Transportation for People with Disabilities in North Dakota 16

Transportation, Distance, and Health Care Utilization for Older Adults in Rural
and Small Urban Areas.....20

Public Transit Regional Coordination Pilot Projects in North Dakota24

Publications.....30

Message from the Editor



In an effort to disseminate our research findings to a wider audience, the Small Urban & Rural Transit Center (SURTC) is introducing a new publication: the *SURTC Research Digest*. The *SURTC Research Digest* provides a number of articles discussing recently completed research projects. The articles are highly-condensed, non-technical versions of the full studies, but they provide more depth and detail than what is published in our newsletter.

This first annual edition of the *SURTC Research Digest* includes articles on seven research projects completed in 2010. Topics range from the mobility concerns of the elderly and disabled to the impact of fuel prices on individuals' travel choices. Additional topics include technology adoption by rural transit agencies, perceptions of higher education students in regard to employment in the public transportation industry, the role that public transportation plays in health care, and efforts to coordinate rural transit services.

SURTC's mission is to be a research support and outreach center to assist small urban and rural transit systems and other transit entities by conducting relevant research and offering outreach and training. This publication, as well as our research reports and newsletters, is an effort to make our research more accessible to a wider audience and accomplish the outreach portion of our mission.

We look forward to your feedback on our research and on the *SURTC Research Digest*. The full reports for all of these studies are available on the SURTC website: www.surtc.org.

Jeremy Mattson

Editor

Ride or Relocate

Del Peterson and Marc Scott

With an impending “aging tsunami” just a few years away, millions of aging Americans will be faced with mobility challenges. At the same time, society will be faced with the question of whether it’s more cost effective to move the elderly to areas where services can be provided or to provide mobility to seniors to allow them to access those services from where they currently reside.

This North Dakota study attempts to begin to answer that question. The objective of this research was to quantify the cost of living at home and riding transit in North Dakota versus relocating to an assisted living facility. Special attention was paid to different home living situations such as homeowners with and without mortgages as well as apartment dwellers. The point at which those living at home should consider a move to assisted living was another objective considered in this study.

It is projected that by 2030, more than one in five Americans will be 65 years of age or older (Population Research Institute, 2008). Public transportation provides freedom to much of the aging population who would otherwise be forced to give up their lifestyles.



Critics of publicly funded transportation argue that many of the aging population would be better off relocating to larger communities where desired services are more readily available (Cox and O’Toole, 2004). Public transportation proponents believe that it is more desirable for aging Americans in rural areas to remain in their homes and utilize public transportation (APTA, 2008).

Previous Research

Bailey (2004) found that, presently, 21% of Americans aged 65 and older do not drive and more than 50% of non-drivers stay home on any given day because they lack transportation options. The most affected populations are those living in rural communities, sprawling suburbs, and households with no automobiles. Older African-Americans, Latinos, and Asian-Americans are also disproportionately affected.

The author also notes that older non-drivers make 15% fewer trips to the doctor, 59% fewer shopping trips and visits to restaurants, and 65% fewer trips for social, family, and religious activities. Of interest to this study, Bailey notes

that for the West North Central region of the country (comprising the states of Kansas, Iowa, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota), 59% of non-drivers aged 65 and older stay home on any given day due to lack of transportation options.

In a 1999 study, Kampfe observed that for many older individuals, residential relocation involves the transitioning from one level of independence to another. The author’s literature review shows that both positive and negative links have been found between residential relocation and psychological well-being.

Research also suggests that an individual's perception of change may have more influence than the change itself. Further, studies on the residential relocation of older persons have observed positive relationships between a sense of self-control and psychological well-being. One way that individuals can maintain a level of self-control is by driving rather than being dependent on transportation from other sources.

As individuals age, their mobility options decrease, and they become more likely to relocate or depend on family members or public transportation for transportation and access purposes. Litman stated that the National Institute on Aging estimates that 600,000 drivers, 70 years and older, lose their driver's license annually. HLB Decision Economics Inc. (2003) estimated that the increase in costs for home healthcare in the absence of public transit would amount to \$58.89 million annually in Wisconsin. Further, the study calculated the benefit of public transit to medical purpose transit trips amounted to \$133.92 million in savings annually for users in the state. This figure represents the general increase in costs associated with the full expense of switching to an alternative mode in the absence of public transportation service for the purpose of medical trips.

North Dakota Assisted Living

The definition of assisted living varies dramatically. For this research, assisted living facilities were those defined by the North Dakota Department of Human Services (2009) as:

"A building that has at least five separate living units where individualized support services are made available to individuals to accommodate needs and disabilities to enable individuals to remain independent. An entity providing assisted living services to five or more individuals in this type of setting must be licensed as assisted living facility by both the North Dakota Department of Human Services and the North Dakota Department of Health."

Currently there are 64 licensed assisted living facilities in North Dakota, with 21 located in the state's four largest cities: Fargo, Bismarck, Grand Forks, and Minot. Dickinson has four licensed facilities. Devils Lake, Jamestown, Lisbon, Valley City, and West Fargo all have two licensed facilities, and 29 towns have one licensed facility each.

Cost Analysis

Our research compared the cost of senior citizens living at home and using home-based health services and transit versus moving to an assisted living facility. Particular attention was paid to the trade-offs between the amount of services required for seniors to live at home versus moving and the costs associated with such trade-offs. Obviously, each individual must make his or her own decision as to whether he or she should live at home or move, and each individual situation is unique. Therefore, to account for some of the uncertainty in service and cost that occur, simulations were conducted. If an individual is confronted with a problem that includes uncertainty, it becomes difficult to use an analytical model that will yield useful information. The simulations imitated real-life situations and determined the annual costs of assisted living in North Dakota versus living at home or in an apartment.

Assisted living costs were found to be higher in most simulations and showed greater variability compared to other alternatives. Although many assumptions were made in both homeowner and apartment scenarios, significant cost differences were evident. When total transit costs and out-of-pocket costs were considered, assisted living became affordable compared to the alternatives, especially in Fargo because of high paratransit operating costs there.

Our analysis indicated that in-home-care service levels played a much more significant role, with respect to cost, than transit service. Note that all simulations highlighted a range of costs, not just an average, to provide a more real-world situation for seniors to consider trade-offs and feasible service levels. For example, a low-cost assisted living facility may be as affordable as living at home with a mortgage or in an apartment, but an average or above-average assisted living center will almost always involve greater cost than the other three living situations considered in this research.

Finally, although cost is important, every senior's situation is unique and other factors such as amenities and safety may contribute more to quality of life and peace of mind for them and their families.

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Intercity Travel Demand in Rural Areas

Jeremy Mattson, Del Peterson, William Thoms, David Ripplinger, and Jill Hough

Increasing fuel costs are causing many Americans to rethink how they get from point A to point B. A SURTC study assessed how those fuel prices and other factors are impacting the attitudes of travelers toward different modes of travel.



U.S. vehicle miles traveled declined in 2008 on both urban and rural highways while public transportation ridership was at its highest level in more than 50 years. Volatile fuel prices and possible changes in transportation policy have created uncertainty regarding the future cost of intercity automobile travel. Given changes in travel behavior, the optimum level and allocation of resources in highways, rail, air, and transit service in rural areas may be changing as well. This study, focusing on rural and small urban intercity travel, may provide some clues as to how individuals are changing their travel behavior and how resources should be allocated to meet their needs.

We surveyed residents of North Dakota and northwest and west central Minnesota to measure their attitude toward intercity transportation. A stated preference (SP) survey was used to ask respondents to identify their mode of choice in different hypothetical situations where there were five travel modes available under differing mode and trip characteristics.

Previous research shows motorists do change their behavior in response to changes in fuel costs. Studies suggest that the price elasticity of demand for fuel is between -0.2 and -0.3 in the short run and between -0.6 and -0.8 in the long run. When individuals reduce their fuel consumption in response to higher prices, they can do so either by reducing vehicle miles traveled or by increasing fuel efficiency. Research shows they use both approaches.

The evidence indicates that a 10% increase in the real price of fuel leads to a long-run decrease in vehicle miles traveled of 3%. The price of gasoline could also have an important effect on mode choice. Some research indicates that increases in gasoline prices do lead to increases in public transportation ridership. These effects tend to be small, but they vary by mode, city, travel type, and travel distance.

The price of gasoline is only one factor that can impact mode choice. Other factors can be organized into three categories: the characteristics of the different transportation modes, the characteristics of the individual making the trip, and the characteristics of the trip itself. The mode characteristics include cost, travel time, waiting time, comfort and convenience, frequency, and access. The characteristics of the individual making the trip include income, age, gender, car-ownership, ability to drive, and preferences and attitudes. Trip characteristics include trip purpose, trip length, and party size. Our survey attempted to include each of these areas.

In our survey, respondents were given a number of hypothetical travel situations and were asked to choose which travel mode they would prefer. They were given five modes to choose from: air, automobile, bus, train, and shuttle van. Each situation contained different mode and trip characteristics, such as different gas price or fare levels and different travel distances and speed. Environmental characteristics – generic trip attributes that do not depend on the mode – included trip distance, trip type, and party type. Trip distances of 30, 60, 240, and 480 miles were considered. Trip type was categorized as either personal or

business, and the party type indicated if the individual was traveling alone or with a group of either family and friends or co-workers. Mode-specific factors included price (the explicit financial cost), travel time, transfer requirements, and frequency of service.

We achieved a response rate of 12.5%, or 237 completed surveys. With each survey respondent given six different SP questions to answer, there were a total of 1,359 SP responses received. The automobile was the mode of choice in 80.4% of these responses, while air, bus, rail, and van accounted for 4.0%, 3.5%, 5.4%, and 6.7% of the responses, respectively.

In addition to these hypothetical situations, the survey asked respondents to identify which modes they actually use for intercity travel. While the automobile was the dominant answer, 14% of survey respondents indicated at least some use of intercity bus, rail, or van for regional travel (less than 500 miles).

The SP survey results show that increases in the price of gasoline lead to decreases in automobile travel, with corresponding increases in bus, train, and van travel. As the per gallon price of gasoline increased from \$2 to \$6, the automobile mode share decreased from 87% to 70%, while the mode shares increased from 1% to 7% for bus, 3% to 8% for train, and 3% to 12% for van. There were also differences in responses based on age, gender, and income of survey participants as well as trip type, party size, and travel distance (see Table 1).

Table 1. Mode Choice Results from Stated Preference Survey, by Distance and Price of Gasoline

Distance/price of gasoline	Auto (%)	Air (%)	Bus (%)	Train (%)	Van (%)
30 miles					
\$2/gallon	96	0	1	0	4
\$4/gallon	89	0	5	3	3
\$6/gallon	77	0	7	8	9
60 miles					
\$2/gallon	91	0	1	3	5
\$4/gallon	90	0	0	2	8
\$6/gallon	74	1	3	9	14
240 miles					
\$2/gallon	90	1	0	6	4
\$4/gallon	85	0	3	5	7
\$6/gallon	72	1	9	6	12
480 miles					
\$2/gallon	73	20	2	4	2
\$4/gallon	62	21	4	9	4
\$6/gallon	61	7	7	11	14

While higher gasoline prices reduce automobile mode share, this effect is clearly more prominent among those with lower incomes (see Table 2). With the price of gasoline at \$2 per gallon, there was little difference in automobile mode share between income groups (85%-87%). However, when the gasoline price climbed to \$6, the mode share for automobile travel dropped to just over half for those in the lowest income group, while declining only slightly in the highest income group.

Table 2. Mode Choice Results from Stated Preference Survey, by Income and Price of Gasoline

Income/price of gasoline	Auto (%)	Air (%)	Bus (%)	Train (%)	Van (%)
< 30,000					
\$2/gallon	85	1	3	4	7
\$4/gallon	74	2	3	8	13
\$6/gallon	51	2	17	17	14
30,000-59,999					
\$2/gallon	87	5	2	3	4
\$4/gallon	83	3	4	5	5
\$6/gallon	72	3	5	8	12
60,000-99,999					
\$2/gallon	86	7	0	3	3
\$4/gallon	83	6	3	5	3
\$6/gallon	73	2	5	6	15
> 100,000					
\$2/gallon	86	7	0	4	3
\$4/gallon	88	5	0	3	3
\$6/gallon	81	3	2	9	5

In response to the questions on travel attitudes, respondents showed the most interest in timeliness, comfort, cleanliness, and predictability. Environmental issues were not found to be a primary concern for survey respondents, though there was a high degree of variation in response to the environmental items. Safety was also not found to be a major concern regarding intercity travel.

The survey data were analyzed using a multinomial logit model, a discrete choice modeling technique. It models the probability that an individual would choose a given mode as a function of the individual, trip, and mode characteristics. In our model, the individual characteristics included age, gender, income, and transit experience; the trip characteristics included trip purpose and party size; and the mode characteristics included travel time, cost, service frequency, and need for transfer.

The results show:

- The odds of choosing air travel decreases for older individuals
- Men are more likely than women to choose automobile
- People of higher income have a greater odds of choosing automobile than those with lower income
- The odds of choosing air travel are greater for business travelers and those traveling alone
- Individuals are more likely to choose automobile if they are traveling for personal reasons rather than business
- People are more likely to choose alternative modes if they have used them in the past

As expected, the odds of choosing a mode are found to decrease as travel time increases and travel cost increases. Also, lower income individuals are found to be more sensitive to changes in travel cost, suggesting that much of the demand shift to bus, train, and van under higher gasoline prices would be from those with lower incomes.

While future fuel costs will impact demand for intercity services, changing demographics may also impact demand. Our findings indicate that an aging population is more likely to choose intercity train, van, or bus service rather than air for regional travel.

One of the unexpected results from this survey is the relative popularity of van service. Van service was chosen roughly twice as often as intercity bus and also more often than rail. Results from the study could provide support for additional intercity van service, but more research is necessary to provide conclusive evidence of the demand for this service.

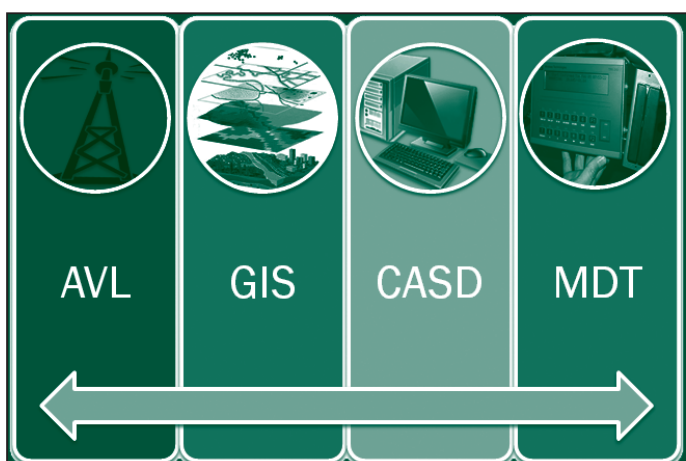
The effect of previous transit experience on choice of mode found in this study is also interesting because it suggests that once a person is familiar with traveling by an alternative mode, he or she is more likely to choose that mode. This implies that long-term demand for a service may increase if more people are introduced to the alternative mode of travel. More research may be needed to confirm this finding, but it is consistent with other studies that have researched habit and mode choice.

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Technology Adoption by Small Urban and Rural Transit Agencies

David Ripplinger and Bethany Brandt-Sargent

Doing more with less is second nature for rural transit agencies, and some of those agencies are finding that doing more with less funding is made possible with increased technology. This study attempts to capture a national picture of technology use by rural transit agencies. The study provides insight on factors that influence technology use by those transit agencies and suggest benefits that can be reaped through technology use.



Transit agencies serving rural areas provide a vital link for many Americans. Demographics, geography, and economics dictate the services they provide and how they can be best delivered. Rural transit requires a commitment to safety and continual innovation to increase efficiency so that no feasible trip goes unserved. At the same time, growing demands of discretionary riders require that transit agencies provide high levels of service.

The technologies used by rural transit agencies include traditional information technology (IT), defined as computer-based information systems and communications technology such as the Internet and cell phones, as well

as systems that are unique to transportation and transit. These systems, referred to as Advanced Public Transportation Systems (APTS), assist rural transit agencies by increasing productivity and capacity or improving safety. Examples of APTS include software that automates scheduling and dispatching functions and on-vehicle technology that identifies the vehicle's location in real time.

While many agencies have adopted specialized technology, prior to this study there has been no resource that provided a national picture regarding the use of specific technologies by rural transit agencies. Beyond a simple description of the current state of practice with respect to rural transit technology, the absence of data on technology use by rural transit agencies has prevented investigation into what factors influence the adoption of technology. While some agency attributes are outside of its control, such as the region an agency serves, others, such as the participation of agency managers at national conferences or formal technology training, are not.

Knowledge of the current use of technology and the attributes that influence technology adoption by transit agencies providing service in rural areas can help guide policy and practice. Agencies that do not use a particular technology, but share the characteristics of other agencies that do, may benefit from additional information on the costs and benefits of implementation or formal technology training. Conversely, agencies that would not be expected to use technology based on their attributes, but that do, may need to be examined to learn if and how the technology is beneficial.

SURTC conducted a national survey of rural transit agencies to collect accurate, current information on technology adoption. For the purposes of the study, rural transit agencies were defined as those organizations receiving Section 5311 funds to provide service to non-urbanized areas, and agencies providing only intercity bus service were not included. The survey was made available online, in paper form, and by phone. The survey was conducted in the summer of 2009 and completed by 451 agencies in 45 states.

Technology Use

The results provide the first national picture of the use of technology by agencies serving rural areas. The survey asked transit agency managers about their agency's use of information technology (i.e., personal computer use, computer server use, Internet use, and IT support), communications technology (i.e., two-way radios, cellular phones, smart phones, text messaging, satellite phones, and wireless local area networks), and rural transit technology (i.e., transit operations software, spreadsheet software to manage operations, GIS, computer aided dispatching and scheduling software, automatic vehicle location, mobile data terminals, traveler information systems, electronic fare payment systems, advanced passenger counting technology, and transit security systems).

The survey found:

- 77% use specialized reporting software, 57% use specialized maintenance software, and 53% use specialized personnel software
- 84% use spreadsheet software to manage some part of their operations
- 25% use GIS, most commonly for scheduling trips, while 43% of those not currently using GIS plan to do so in the next five years
- A third use computer aided dispatching and scheduling software (CASD), and close to half of those not currently using CASD expect to within the next five years. This software is most commonly used for scheduling, reporting and record keeping, and trip request processing, as well as other functions.
- 6% use Automatic Vehicle Location (AVL) technology, most commonly for dispatching, but 45% of those not using the technology plan to do so in the next five years.
- 9% currently use Mobile Data Terminals (MDTs).
- 4% currently use Traveler Information Systems.
- 2% use Electronic Fare Payment (EFP) systems. Of the agencies that use EFP systems, all use magnetic stripe technology, while some use smart card or barcode readers.
- 2% use Advanced Passenger Counting (APC) technology.
- One-fifth use security system technology, most commonly cameras.

Factors Affecting Technology Adoption

Statistical analyses were conducted to determine the complex relationships among agency, community, and manager attributes and technology adoption by rural transit agencies. This is important from a practical standpoint as technology use varies tremendously among apparently similar agencies providing transit service to rural areas. This analysis examined adoption of four specific technologies: AVL, CASD, GIS, and MDTs.

One consistent finding is that larger agencies, measured in terms of fleet size or number of trips, are more likely to use these technologies. Trip costs and organizational structure were also found to influence adoption of some technologies.

Characteristics of the transit manager can play a role in technology adoption as well. The study found that the longer the transit agency manager has worked in the industry, the more likely that their agency uses AVL. This may be due to an understanding of the operational needs of their organization and the benefits AVL would provide. On the other hand, more educated and experienced managers are less likely to use CASD software. This may be due to technology aversion by older workers or a better understanding of transit operations and a resistance to adopt unhelpful technology. Agencies with managers that have attended sessions on technology are much more likely to use GIS but less likely to use AVL.

Implications for Policy, Practice, and Further Research

The results of the analysis have significant implications for rural transit policy and practice. While some factors that impact technology adoption cannot be controlled, others, including activities of rural transit agency managers, can. Encouragement of these activities by state or federal program administrators or

self-motivation by managers who know which activities to participate in may influence the adoption of technology. At the same time, knowledge of agency attributes that affect technology implementation can help identify which agencies might benefit from technology adoption. Conversely, the analysis can assist in identifying agencies that are not expected use technology but do.

The analysis identified three manager activities that influence technology by rural transit agencies:

- attendance at national meetings,
- interaction with product vendors, and
- participation in technology training.

Encouragement by state departments of transportation and the Federal Transit Administration may influence adoption of technology by transit agencies. Of course, agency managers themselves can take initiative and pursue these activities independently. However, this does not imply that there will be an increased rate of adoption.

Attendance at national meetings provides transit agency managers with unique opportunities that may impact technology adoption. These include exposure to new ideas in formal sessions and to specific technology products at vendor shows as well as interaction and networking with other transit agency managers from across the country. Perhaps most importantly, national meetings provide the opportunity for attendees to step away from the day-to-day operational demands of their agency and think strategically about organizational and community mobility needs, which is often the first step in innovation and technology adoption.

Interaction with vendors at national meetings, on-site, or remotely, educates transit agency managers on specific technologies and how they might benefit their agency. A discussion with vendors does not require that a specific technology project be under consideration. Guidance on effectively interacting with technology vendors is available from a number of sources and is occasionally the subject of sessions at state or national conferences.

Participation in formal training may provide managers with knowledge of concepts, tools, and processes necessary to successfully adopt technology in their rural transit agency. The National Transit Institute provides a two-day course on implementing rural transit technology that covers these topics. Shorter training opportunities on specific areas are often provided at state or national transit conferences.

Findings from the analysis of technology adoption can be used to determine which agencies might benefit from technology based on community, agency, and manager attributes. Conversely, agencies that do use technology, but are not expected to, based on their characteristics, can be identified to determine if and how they benefit from the technologies they use.

For example, the analysis found that larger agencies, as measured by fleet size, are more likely to use technology. However, some agencies with large fleets use relatively little technology, while some small agencies use a number of technology systems. Individual investigation of each of these agencies will likely provide a better understanding of the decision to implement technology and the benefits that result.

While the survey collected a large amount of data on technology use by rural transit agencies, it did not request detailed agency-level cost or benefit data. This was done to avoid a lower response rate that was expected to result from asking for detailed information. However, the survey did ask participants to report if their agency had recently implemented technology. A follow-up survey of these agencies that requests costs, including those per unit, and benefits may be worthwhile. At the same time, more thorough case studies that provide a more complete understanding of the context in which adoption decisions were made and a thorough collection of benefits and costs would also be beneficial to the industry.

This study was published as UGPTI Departmental Publication No. 226 and is available at <http://www.ugpti.org/pubs/pdf/DP226.pdf>.

Public Transportation Workforce Development: A Survey of Vocational and University Students

David Ripplinger and Jill Hough

The success of transit agencies relies, in part, on their ability to recruit and retain a skilled workforce from executive decision-makers and leaders to frontline staff and vehicle operators. SURTC conducted a study to learn more about the expectations of the next generation of workers and their perceptions of careers of public transportation.

The study will help the industry address concerns over an aging workforce, with many employees eligible for retirement within the next decade, and the need for workers with ever-increasing skill sets. The study dovetails with industry-wide efforts such as the Council of University Transportation Center's (CUTC) national workforce summits and the American Public Transportation Association (APTA) Blue Ribbon Panel on Workforce Development, which are designed to identify workforce needs, opportunities, and strategies.

Transit workforce development takes on a number of dimensions. The industry requires community colleges and universities to provide the requisite educational foundation for the next generation of workers. To attract and retain workers, transit must provide its employees with an acceptable workplace environment, opportunities for growth, and attractive compensation, which consists of more than just a competitive salary. Ongoing training is necessary to provide employees with up-to-date skills.

However, to date, there have been very few studies about the expectations of the next generation of workers and their perceptions of careers in public transportation – important information for designing efforts to recruit new workers. To assist in this effort, a survey of university and vocational students was conducted to identify attitudes and behaviors that impact student choices of academic majors, internships, and careers. The study also examined perceptions of internships and careers in public transportation and use of job search methods.

The survey was conducted of students enrolled in programs in the Fargo-Moorhead metropolitan area, including those enrolled at North Dakota State University, Minnesota State University Moorhead, and Minnesota State Community and Technical College – Moorhead.

Results provide an understanding of current university and vocational students' perceptions of internships and careers in public transportation. The survey identified a number of workforce issues that the industry must address to attract and retain high-quality talent. Fortunately, these transit workforce needs can be addressed by targeted strategies.

Key Findings

Students don't know what to expect from an internship or career in public transportation

Few students reported strong opinions about internships and careers in public transportation. This may be due to them not having information on the industry or having inadequate time to form attitudes. Most university students that participated in the survey are unlikely to be familiar with large urban transit systems or the number and diversity of jobs that exist in transit.

Students don't find some aspects of internships or careers in transit appealing

The few characteristics of transit internships and careers that students did have strongly formed opinions about weren't viewed favorably. Students did not see work in transit as being challenging, allowing for creativity, providing the opportunity to work with technology, providing a good initial salary, or providing social prestige.

Students don't believe that transit internships provide what they want

An opportunity to apply skills acquired in the classroom and to develop new skills were two of the top factors impacting students' choice of internship. However, students did not expect to encounter these factors in transit internships. This may be due to a lack of understanding of the opportunities provided by transit internships.



There are misconceptions about careers in transit

Transit is a large industry with diverse career opportunities. In addition to vehicle operators, transit employs general, financial, and operational managers, as well as engineers, planners, IT support personnel, mechanics, and administrative support staff. Students are typically unaware that transit occupations possess attributes they desire.

Many students are planning on careers in fields unrelated to transit

Some students have identified careers in industries with specific skill sets that may not be put to best use in transit, e.g., healthcare majors. However, students with diverse majors and career plans would benefit from interning or working

in a transit agency. Successful transit professionals have come from many backgrounds. Many of these professionals never planned to work in transit.

Strategies

Educate students on internships and careers in transit

The transit industry should educate students to help them form positive attitudes and address misconceptions about work in the field. At the same time, the many positive attributes of the transit industry should be leveraged. Local activities that could address this goal include working with career services at local community colleges and universities, using social media to interact with and educate students, and developing student transit ambassadors to expose transit to vocational and university students.

On a national level, an organization such as APTA could launch an organized effort to provide tools to local agencies that are too short-staffed to individually undertake such an effort. APTA could also assemble a clearinghouse of best practices in workforce development from agencies across the country. Similarly, assistance from the Federal Transit Administration in facilitating and financing internships at transit agencies would be helpful.

Target efforts

While the need for new workers over the coming years is relatively large, given the size of the transit workforce, it is a small part of the entire labor market both locally or nationally. Regardless of the size of the labor force, transit must compete with other industries for the best students and workers. Individual characteristics that are positively related to interest and success in transit careers should be identified. Education and recruiting efforts should target individuals with these attributes, but those without the identified characteristics should not be ignored.

Transit Industry Initiatives

The transit industry can benefit from conducting marketing and outreach activities that address areas beyond workforce development. Transit has proven its value the past few years by demonstrating its role in community livability, preserving the environment, reducing foreign fuel dependence, and economic development. Areas where transit's standing is relatively weak should also be identified and addressed. Industry-wide marketing and outreach efforts will have positive impacts on attracting and retaining the next generation of transit workers, especially as it provides additional opportunities for individuals to form positive opinions of the industry. The marketing effort need not be resource intensive. Proper use of social networking tools could serve this purpose.

Work with broader transportation industry

Many of the challenges facing transit are shared by the wider transportation industry. Opportunities to partner with other modes and industry groups should be identified and pursued. Collaboration between federal modal administrations and modal industry groups in addressing transportation workforce development needs should continue. The level of activity should increase relative to previous years as transportation workforce development needs continue to grow.

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Transportation for People with Disabilities in North Dakota

Jeremy Mattson, Jill Hough, and Alan Abeson

For adults with disabilities, access to community transportation is often limited or non-existent. Because mobility is so fundamental to quality of life, we assessed transportation options and needs of those with disabilities in North Dakota.

Mobility is fundamental for people to live full and satisfying lives in their communities, opening opportunities for employment, civic involvement, health care, shopping, socialization, and participation in community activities. Without mobility, people may experience isolation and depression. While the need to improve this situation is increasingly being recognized, moving forward requires current and accurate information about transportation services used and needed.



To assess the existing and needed community transportation for people with disabilities in North Dakota, we developed and administered a survey to a sample of people with disabilities in the state. The survey was designed so that it could be used by communities and states beyond North Dakota for collecting similar information and so that it could be used over time to assess progress in providing transportation for adults with disabilities. We used the survey to collect information from individuals regarding their travel behavior, ability to make needed or desired trips, use of community transportation options (public transit, human service agencies, other), unmet needs, and difficulties encountered. We also gathered demographic and socioeconomic information. The North Dakota Disabilities

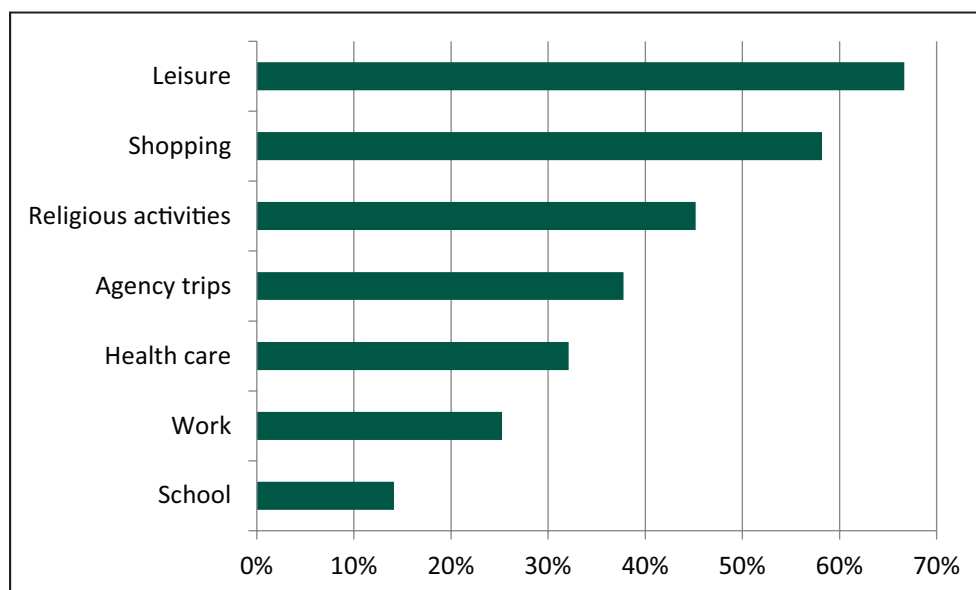
Advocacy Consortium and other agencies cooperated with SURTC in distributing the survey.

Responses were received from 131 people, including those with physical, sensory, cognitive, and emotional disabilities. Respondents were dispersed geographically, representing most areas of the state including larger cities, small cities, and rural areas. A large percentage of the respondents were transit-dependent or dependent on others for rides. More than half, or 58%, were unable to drive, and most had some experience with public transportation. Respondents were predominantly from low-income households, which can contribute to difficulties in obtaining transportation because these individuals are especially sensitive to cost.

Survey Results

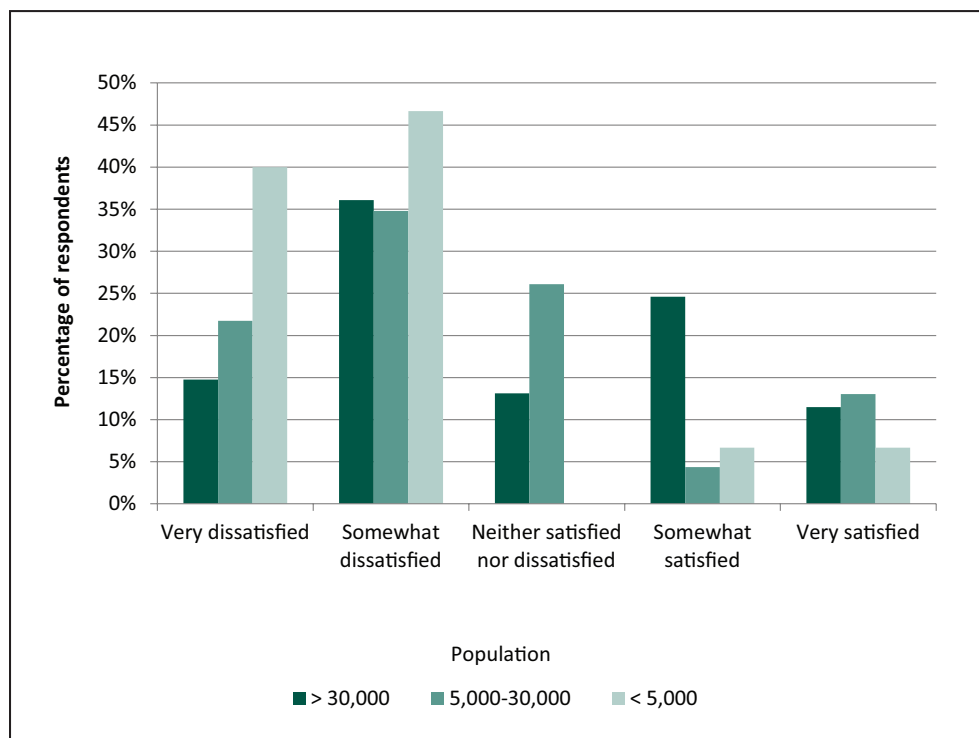
Results indicate that a significant percentage of respondents desire more trips than they are currently taking, and that a lack of transportation appears to be the main limiting factor. Transportation is critical for people to meet basic needs, such as going to work or accessing health care services, and many indicate they are unable to make as many trips for these basic needs as they desire. Beyond meeting basic needs, there is also a strong desire to take more trips for activities that prevent isolation and enrich life, such as social interactions and faith-based participation. Unmet demand was greatest for leisure, recreation, and social trips, as about two-thirds of respondents said they desired more of these types of trips, while 59% desired more shopping trips (see Figure 1). Transit services that provide access to health care or to jobs provide a vital service, but if the service is limited to those trips, then transit-dependent individuals are limited in their abilities to take discretionary trips that can prevent isolation and enrich life.

Figure 1. Percentage of Respondents who Take Fewer Trips than Desired Due to a Lack of Transportation, by Trip Type (n=115)



The survey revealed significant dissatisfaction with available transportation options both in the community and for long-distance trips. While individuals from both urban and rural areas were dissatisfied, the level of dissatisfaction was greatest in rural areas (see Figure 2).

Figure 2. Satisfaction with Transportation Options Available in Your Community, by Community Size



Service availability was the most significant concern with public transportation. Respondents were most dissatisfied with unavailable or insufficient weekend and holiday hours. Respondents were also dissatisfied with waiting time, scheduling procedures, and ride reservation time. They were most satisfied with being safe from both crime and accidents and were generally satisfied with drivers. Respondents were more satisfied than dissatisfied with the availability of door-to-door service, vehicle comfort, and access to information. In nearly every case, people who cannot drive, or those who are more transit dependent, were less likely to be satisfied with public transportation.

The most commonly cited problem with public transportation was absent or inadequate shelter while waiting for vehicles. Other commonly reported problems include busy intersections to cross, difficulty getting to bus stops, difficulty reading or understanding maps or schedules, stairs or uneven ground problems, and poor or no sidewalks. While many of the problems studied are important for people of all types of disabilities, some problems are more severe for certain groups of individuals. For example, people with sensory disabilities were more likely to say that busy intersections to cross is a problem; people with physical disabilities were more likely to report a problem with getting to the bus stop; and people with cognitive or sensory disabilities were more likely to have problems reading or understanding maps or schedules or be concerned about exiting at the correct stop.

Because paratransit users may experience different problems than those using fixed-route services, problems specific to this mode were also identified. Two-thirds of respondents said that service not being available when they need it is a problem, and 35% rated it as a major problem. Other significant problems were schedules for pickups and drop-offs not being fulfilled or long waits, the need for scheduling trips too far in advance, and trip times that are too variable or unpredictable.

Analyzing the differences in responses between those who currently use public transportation, those who have in the past but do not anymore, and those who have never used public transportation provides some insight into why some use public transportation and others do not. Lack of service, lack of information, thinking they are not capable of riding (whether it is true or not), and fear of riding are all likely factors keeping people with disabilities from using public transportation. Even though cost is a concern for many respondents, especially those with lower incomes, it does not seem to influence use. Users were just as likely as non-users to say that it is too costly.

Implications

Many of the improvements that people with disabilities desire – improving or adding new bus shelters, adding weekend or holiday service, reducing wait times, or improving sidewalks – would benefit all users. Research shows that people with disabilities are more likely to have problems with public transportation, but those without disabilities also experience difficulties. Many problems are not specific to people with disabilities, but those with disabilities are most negatively impacted. Consequently, the concept of universal design — the idea that equipment and infrastructure should be designed to be easy to use for as much of the population as possible — is important. The appeal of universal design is that it makes products or services easier to use for all people and not just individuals with disabilities.

We recognize that cost is a factor in responding to some of the deficiencies in transportation for people with disabilities documented in this study. Consequently, we emphasize that remedying many of these inadequacies would benefit all North Dakotans that already do or could use public transportation. For example, adding weekend and holiday service and expanding evening service could enable people other than those with usual day schedules to get to and from work. Other improvements, such as improving scheduling procedures or reducing waiting times, could be undertaken with limited cost but would be highly beneficial and likely result in additional people using public transportation, resulting in lower per-ride costs for all and increased fare revenue.

Coordination by all agencies involved in providing public transportation may be the best and most cost-effective solution for increasing hours of service and number of trips available. Given that resources are limited, efforts at coordinating transportation services are increasingly being made across the country and in North Dakota. Coordination models can range in scope from shared use of facilities, training, or maintenance to integrated brokerages or consolidated transportation service providers. Benefits can include increased efficiency and productivity, enhanced mobility, and improved level of service. A number of barriers to coordination, both real and perceived, that must be identified and addressed.

Changing demographics could intensify the need for improved transportation options. The percentages of the population both in the state and nationwide aged 65 or older and 80 or older will increase significantly in the coming decades, and since disability rates increase with age, the number of people with disabilities is expected to grow, creating increased needs for transit services.

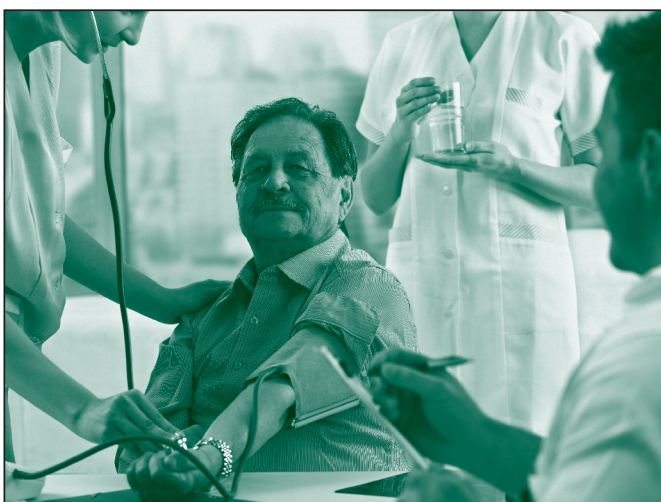
While this study covered a wide range of topics, one of its limitations is the small sample size. This survey could be conducted again in a few years to determine if there have been any improvements. Further study also could be useful for identifying the most cost-effective approaches for improving transit services.

This study was published as UGPTI Departmental Publication No. 231 and is available at <http://www.ugpti.org/pubs/pdf/DP231.pdf>.

Transportation, Distance, and Health Care Utilization for Older Adults in Rural and Small Urban Areas

Jeremy Mattson

Evidence shows that people in rural areas use health care services less than their counterparts in more urban areas. That could at least partly be because it's more difficult for rural residents to get to the doctor and other health care services. Other possible explanations include differences in the number of physicians available or individual characteristics, but longer travel distances and fewer transportation options available in rural areas could also play a role.



In this study, we assessed the impacts of transportation and travel distance on use of health care services by older adults in rural and small urban areas. We also studied how many trips are missed due to lack of transportation and estimated the characteristics of those people who miss trips; determined how much older adults rely on public transportation for medical trips; discovered the concerns older adults have with using public transportation for medical trips; and estimated the demand for using public transportation for medical trips among those who do not currently have access to transit.

The study is particularly timely because the present situation is being compounded by the growing number of senior citizens who are

choosing to age in place in rural areas. Unfortunately, some of them may be forced into moving to improve their access to health care. If providing transportation to health care for those who lack it increases the utilization of these services, there could be cost benefits in terms of reduced need for emergency care and preventable hospitalizations.

A survey was distributed to a random sample of individuals aged 60 or older living in North Dakota, South Dakota, Montana, and Wyoming. With resulting survey data, we developed a model based on the Health Behavior Model (HBM) that considered transportation and geography as factors that could enable or impede health care utilization. The HBM, which has been effectively applied by health economists, states that an individual's use of health services is a function of his/her predisposition to use services, factors enabling or impeding use, and need for care.

We received 543 survey responses, yielding a response rate of 20%. The age of respondents ranged from 60 to 95, with the median age being 70. The median distance that respondents said they travel to health care services was 5 miles for routine health checkups, 9 miles for chronic health care visits, and 5 miles for emergency care (see Table 3). There was considerable variation in the reported distances, as some respondents live in towns within a few blocks of health care service, while others reported the need to travel 100 or more miles.

Respondents used various means to get to health care:

- 89% said they drive themselves
- 55% said they will at least sometimes get a ride from a family member or friend
- 5% use a public van or bus
- 4% walk or ride bicycle
- 3% get a ride from a volunteer driver
- 2% ride in a human service agency car or van
- 1% take a taxi

The types of transportation used differ somewhat based on gender, age, whether the person has a disability, and geographic characteristics (see Table 4).

Table 3. Distances Traveled to Health Care Services by Survey Respondents in North Dakota, South Dakota, Montana, and Wyoming

	Percentiles						
	n	Average	10th	25th	Median	75th	90th
	-----miles one way-----						
Routine health checkups	522	17	0.5	2	5	20	41
Chronic health care visits	496	42	1	2.5	9	55	120
Emergency care	513	17	0.5	2	5	22	43

Table 4. Transportation Used to Access Health Care by Survey Respondents

	n	Drive yourself	Get a ride from family member or friend	Get a ride from volunteer driver	Ride in human service agency car or van	Take public van or bus	Take taxi	Walk / bicycle
-----Percentage-----								
Total	532	89	55	3	2	5	1	4
Gender								
Male	255	91	46	4	2	4	1	4
Female	284	89	62	3	2	6	1	4
Age								
60-69	255	95	51	2	1	4	1	6
70-79	177	89	53	3	2	4	1	3
80+	93	78	67	6	5	10	3	0
Disability								
Yes	133	73	68	7	3	11	2	2
No	389	95	51	2	2	3	1	5

Findings indicated that need for care is the most significant variable determining the number of health care trips taken. Distance and transportation variables did not significantly influence the number of routine or chronic care trips made overall, indicating that people who needed to make health care trips were able to access the necessary transportation, regardless of distance or ability to drive. The results were different for emergency care, however, where the number of transportation options used positively influenced the number of trips, with the effect being greater for those who do not drive.

Additional results, however, found that distance and transportation factors do have an influence on routine and chronic care. First, those who cannot drive make more trips if someone else in the household can drive. Second, distance and access to transportation impact the likelihood that someone will miss or delay a trip. Finally, difficulty reported in making trips is significantly affected by distance and availability of transportation options.

For those who do not drive, the odds of making additional routine or chronic care trips increase by a factor of about 2.3 to 2.4 when there is someone else in the household who can drive. Older adults who are widowed or living alone, therefore, are less likely to obtain their needed health care. These results have important implications regarding the need to provide additional transportation services for older adults.

Findings also show that people who drive are substantially less likely to miss or delay a medical trip, and those with someone else in the household who can drive are also less likely to miss or delay trips, while the likelihood of missing or delaying routine trips increases with distance. These results suggest that even though the total number of trips taken may not be affected by distance or transportation factors, individuals are more likely to miss a scheduled trip if they cannot drive, do not have someone else in the household who can drive, or the distance is too great. Individuals who miss a scheduled trip then have to make up that missed appointment at a later time. The results suggest that they do eventually make those trips, but if they are delaying the trips to a later time, they may not get the care at the time they most need it. Moreover, the level of care required may be more serious and more costly.

Individuals who must travel longer distances are also significantly more likely to say that getting transportation to health care is difficult. The burden of getting transportation to health care increases with distance and is also greater for those who ride with a family member, friend, or volunteer driver. Those who rely on friends, family, or volunteer drivers may benefit from access to public transportation.

To suit respondents' needs, the type of transit service provided needs to be convenient and frequent enough, and the transit and medical schedules need be coordinated. Respondents also cited a need for door-to-door service. Greater coordination between transit providers and health care providers would benefit those relying on transit.

Expansion of transit service and greater awareness of available service in rural areas could also be beneficial for those who cannot or prefer not to drive. More than half of respondents said they either do not have demand-response service available to them or they are not aware of such service. More than two-thirds said the same about fixed-route service, and nearly three-quarters indicated either a lack of intercity service or no awareness of such a service.

Future research on the impacts of public transportation on health care utilization and transportation difficulties will need to gather data from a larger number of transit users. The number of transit users who responded to this survey was too small to make too many conclusions regarding transit.

In response to an open-ended question about concerns with transportation to health care, respondents commonly mentioned that they currently do not have problems with transportation, but many noted that it could be an issue in the future and that they would be very grateful to have public transportation services available to them if and when that time comes. Some commented that if they are ever unable to drive, they would have to move to a bigger city. Many respondents mentioned relying on family members for rides, which can be difficult at times because family members often have jobs and other commitments.

There is a need establish a stronger link between health care and transportation research. By providing individuals transportation to health care services, especially preventive care, they can learn to manage their conditions better, their health status may improve, and in the long-run there could be a decrease in health care costs. With an aging population, the number of older adults who can no longer drive or who are widowed and living alone will continue to rise. These individuals will face increased difficulties in getting transportation to health care. For public transportation to be able to effectively serve this population, transportation providers and health and social service providers will need to increase communication and coordination to make the best use of scarce resources.

This study was published as UGPTI Departmental Publication No. 236 and is available at <http://www.ugpti.org/pubs/pdf/DP236.pdf>.

Public Transit Regional Coordination Pilot Projects in North Dakota

Jon Mielke, Carol Wright, David Ripplinger, James Miller, and Del Peterson

Coordination by transit agencies may be a cost-effective solution for improving efficiencies and quality of service. The economic benefits of coordination can include additional funding, increased efficiency, increased productivity, enhanced mobility, and increased economic development; and other expected benefits include improved service quality and more people served.

SURTC recently developed implementation plans for two public transit regional coordination projects in North Dakota. Regional public transportation coordination efforts have been undertaken across the country and vary greatly from state to state. These differences are a product of unique mobility needs, available resources, geography, history, and politics. Studying this diversity in policy and practice enhances North Dakota's effort to formalize the coordination of transit services.

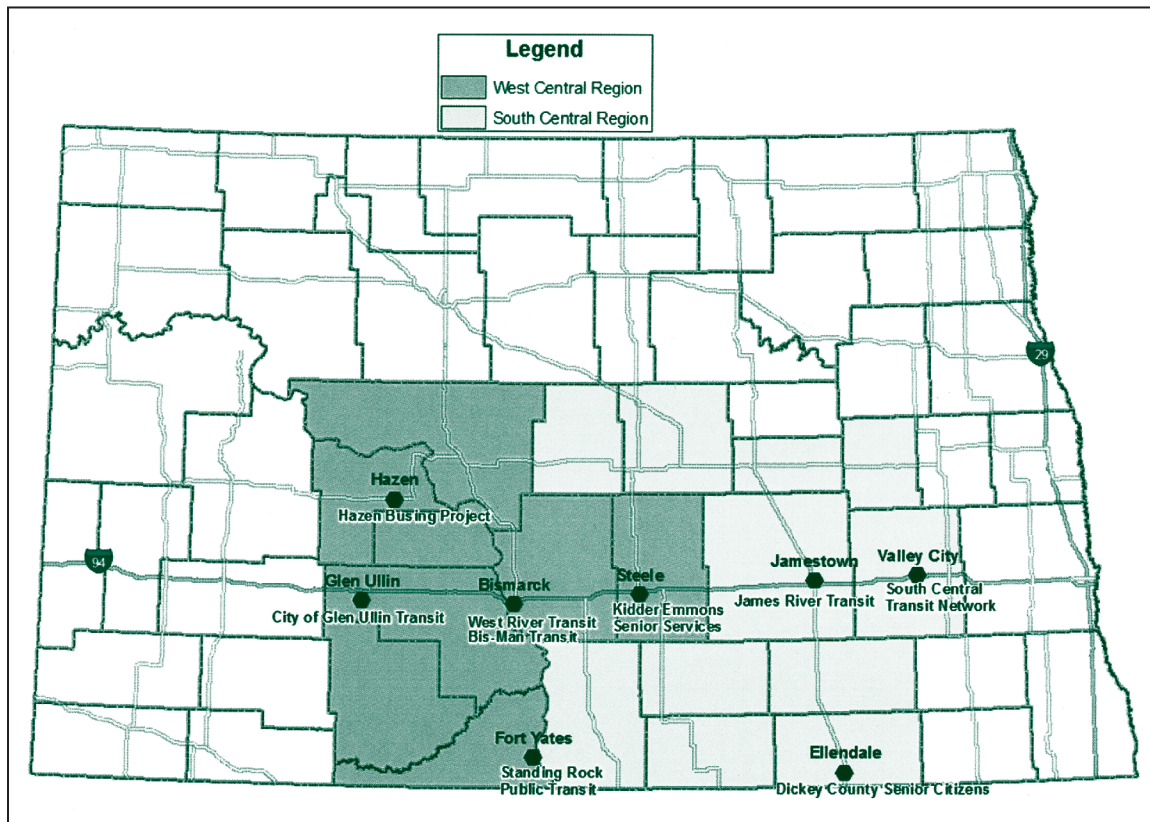
State Legislation

In light of the potential benefits of coordination, North Dakota's 2009 Legislature enacted legislation (Senate Bill No. 2223), directing the North Dakota Department of Transportation (NDDOT) to develop two public transportation coordination pilot projects. The legislation prescribed that each of the two pilot regions should have a regional coordination administrator who would coordinate the provision of public transportation services in the region. Related goals included cost effectiveness, efficiency, and the reduction of fragmentation and duplication of services. One region was to have a city with a population of over 35,000 and one was to have no city with a population of that size.

NDDOT subsequently solicited proposals and contracted with SURTC to study coordination options and develop related implementation recommendations. SURTC provided an interim version of the final report in December 2010, in time for NDDOT to present related findings and recommendations to the 2011 Legislature.

NDDOT and SURTC representatives met in early February 2010 to identify regions that should be included in the pilot project. The contiguous south central and west regions were selected (see Figure 3). Jamestown, with a 2000 census population of 15,527, is the largest city in the nine-county south central region. Bismarck, with a 2000 population of 55,532, is the largest city in the ten-county west central region.

Figure 3. Selected Regions for Pilot Project



Barriers to Coordination

Coordination is already taking place in North Dakota's transit industry. There are, however, significant opportunities for additional progress. A major impediment is the lack of facilitating structures and the lack of time that transit directors have to devote to the issue. Only two of the nine directors in the pilot regions devote 100% of their time to transit operations. Most have numerous non-transit responsibilities, including city administration or senior programs which often involve congregate and home delivered meals, outreach services, prescription drug assistance programs, food banks, and durable medical equipment loan programs. The recommendations of this report address this major barrier to coordination.

Many of the regions' transit services began as nutrition-related programs that served the communities' senior population. These programs have grown significantly, along with residents' needs and increases in funding from the federal and state governments. What were once relatively small undertakings are now, in many instances, sizeable programs. Quite often, organizational structures have not been adjusted to adequately address program demands.

Given the many demands that face transit directors, dedicating significant time to pursue increased coordination with other service providers or local client groups is not an option. Consequently, it would not be prudent to institute coordination-related mandates that place additional requirements on local program directors without providing them with the resources that are required to help them be successful. The recommendations outlined in this section do place additional requirements on local transit operators, but they also provide additional resources that should enable them to be successful partners in the state's coordination efforts.

In addition to the lack of time and prioritization, a number of other barriers to coordination exist. They include concerns about workload, budget, and bureaucracy; statutory misperceptions and negative prior experiences; territorialism and protectionism; resistance to change and lack of local champion; misunderstandings and prejudices; specific rider needs; personality conflicts among the region's transit managers; lack of expertise; differing fare structures; institutional requirements; and state initiatives.

Recommendations

SURTC developed 22 recommendations to satisfy both state and federal coordination requirements (see Table 5). These recommendations also include several best practices initiatives that would increase operating and administrative efficiencies in North Dakota's transit industry. This report's recommendations are consistent with related studies undertaken by the National Conference of State Legislatures.

These recommendations were developed after an extensive information gathering process which included a review of other states' coordination plans, interviews with all nine of the regions' transit operators, and eight public input meetings held throughout the pilot regions. The recommendations were reviewed by steering committees in each region, the regions' transit operators, and attendees at four public information meetings. Committee members and all of the state's public transit operators were also given an opportunity comment on the draft report.

Primary recommendations include the creation of regional coordination committees in each region and a requirement that each transit service provider have a local advisory board comprised of local transit users/advocacy agencies, human service agencies, businesses, local government, economic development organizations, and other local transportation service providers. Many local transit operators already have local advisory boards, but all transit providers should have them.

As provided for in Senate Bill No. 2223, each region should have a regional coordination administrator. It is recommended that one administrator will be sufficient for the two pilot regions. This person will facilitate the creation and operations of regional committees and local boards and will be responsible for related planning functions, including multi-year coordination and operating plans.

There was not universal support among the regions' transit operators regarding the need for regional coordination administrators and regional coordination councils. Note, however, that transit coordination is provided for in S.B. No. 2223 and federal law. Regional coordinating councils and related staff support are an integral part of this process. This report's recommendations concerning regional coordinating councils and regional coordination administrators are consistent with the provisions of S.B. No. 2223 and put structures and processes in place that further the coordination provisions of federal law and the Federal Transit Administration.

The report's recommendations are prioritized and budgets are presented for the 2011-13 and subsequent bienniums. Initial deployment costs total \$855,000 for the 2011-13 biennium, much of which is for non-recurring start-up costs and all of which may be paid for with available federal funds. This total includes regional coordinator costs and one-time contract assistance for start-up work, including the formation of local and regional advisory boards and the development of local and regional coordination plans, and the expansion of the coordination effort to include three more regions of the state.

Biennial costs will increase as more regions of the state are included in the coordination process, but they will eventually decline and stabilize at approximately \$920,000 per biennium once the entire state has been through the planning and implementation process. All project costs are eligible expenditures under existing Federal Transit Administration rural transit program guidelines. Other than a possible statutory amendment which would make the coordination of transit services a state priority, all of the report's recommendations may be implemented without additional legislative action.

This report's recommendations regarding coordination put structures and planning processes in place that will facilitate regional and local decision making. It is hoped these structures will bring the right people together to make informed decisions concerning the provision and coordination of future transit services. It is important to note, however, that these recommendations do not prescribe what levels of service should be provided. Those are decisions that should be made at the local level.

This study was published as UGPTI Departmental Publication No. 237 and is available at <http://www.ugpti.org/pubs/pdf/DP237.pdf>.

Table 5. Recommendations Summary

Recommendation	Directly Related to S.B. 2223	Related to Federal Law and/or Executive Order	Industry Best Practice	Other Research Findings
1. Avoid unnecessary bureaucracy and intermediaries			✓	✓
2. Statutory amendments - make coordination a state priority and consider giving counties the ability to levy a tax to support the provision of transit services		✓	✓	✓
3. Require establishment of regional coordinating councils	✓	✓	✓	✓
4. Require establishment of local advisory boards		✓	✓	✓
5. Require regional coordination plans	✓	✓	✓	✓
6. Require local coordination & operating plans		✓	✓	✓
7. Give NDDOT discretion in determining regional transit boundaries and suggest boundaries for two pilot regions	✓		✓	✓
8. Create regional coordination administrator job description	✓		✓	✓
9. Contract for initial implementation support	✓		✓	✓
10. Provide funding for local administrative support	✓	✓	✓	✓
11. Expand coordination effort to other regions	✓	✓	✓	✓
12. Create mechanisms to publicize available services & changes	✓	✓	✓	✓
13. Establish uniform operating standards for all service providers and provide policy and procedure templates	✓		✓	✓
14. Develop consensus on use and deployment of dispatch software		✓	✓	✓

Recommendation	Directly Related to S.B. 2223	Related to Federal Law and/or Executive Order	Industry Best Practice	Other Research Findings
15. Develop long-term vehicle replacement plans	✓		✓	✓
16. Specific recommendations concerning coordination-related cost saving/revenue enhancement efforts	✓			✓
17. Establish guidelines for fare cost recovery & uniformity	✓		✓	✓
18. Use performance measures to track operations	✓		✓	✓
19. Monitor workload of NDDOT transit staff and adjust as appropriate			✓	✓
20. Operator-specific modifications to facilitate coordination, cost-savings, and/or service enhancements	✓			✓
21. Prioritize implementation of recommendations	✓	✓	✓	✓
22. Develop short and long-term budgets and identify possible funding sources	✓		✓	✓

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