UGPTI

Upper Great Plains Transportation Institute
North Dakota State University

Annual Report, 2001 - 02

Advisory Council Members

Mark Bazan
Canadian Pacific Railway

Judge Barth
North Dakota Wheat Commission

April Fairfield
North Dakota Farmers Union (NDFU)

Dale Anderson
Greater North Dakota Association (GNDA)

LeRoy Ernst
North Dakota Motor Carriers Association

Tony Clark
North Dakota Public Service Commission

Herb Manig
North Dakota Farm Bureau (NDFB)

Wade Moser
North Dakota Stockmen's Association (NDSA)

Gary Ness
North Dakota Aeronautics Commission

Jim Boyd
North Dakota Department of Commerce

Steve Strege
North Dakota Grain Dealers Assn. (NDGDA)

Upper Great Plains Transportation Institute
North Dakota State University
430 IACC Bldg., P.O. Box 5074
Fargo, ND 58105
(701) 231-7767 tel.
(701) 231-1945 fax.
www.ugpti.org

Contents

University President's Message 1

Advisory Council Chair's Message 1

Director's Message 3

Research 4
- Intelligent Transportation Systems 4
- Logistics & Rural Economic Development 5
- Rural Aviation 6
- Motor Carrier Safety, Economics & Management 7
- Railroad Operations & Economics 9
- Transit 10
- Rural Roads & Bridges 10
- Miscellaneous 10

Mountain-Plains Consortium 11

Advanced Traffic Analysis Center 12

TEL8 13

Department of Transportation Support Center 14

Transportation Safety Systems Center 15

Small Urban and Rural Transit Center 16

Graduate Transportation Options 17

Annual Awards Banquet 18

Research Staff 19

Support Staff 25

University President's Message

Joseph Chapman

North Dakota State University is an institution that is reaching for the next level of excellence in all areas. The Upper Great Plains Transportation Institute is an active participant in that effort.

The Institute has a strong reputation as one of the top university transportation centers in the country. As it makes significant contributions to small urban and rural transportation issues, the Institute demonstrates NDSU's strong tradition of commitment to education, research and service.

This is a very special institution at a remarkable time in its history. NDSU has moved forward in the areas of expanded services to students, improved salaries for faculty and staff, progress in the areas of research and graduate education and movement forward with the NDSU Research and Technology Park.

With an enrollment of more than 11,100 students, NDSU has an outstanding reputation that has allowed us to recruit from among the nation's best and brightest. We are now an institution of choice for many researchers and scholars.

But, NDSU's transformation is just getting started. While these are truly exciting times for scholarship and research at this institution, we feel the many opportunities that lie before us will help to create a future that will benefit our students, the public, businesses, our faculty and staff. The work of the Upper Great Plains Transportation Institute is an important partner in that future.

Advisory Council Chair's Message

Dale O. Anderson

North Dakotans are working together more effectively than ever through collaboration, accountability and trust to create a more economically competitive state. North Dakota must accelerate its efforts to expand knowledge-based industries if the state is to compete successfully in the global economy. Central to this challenge is change.

The most effective way to affect change is through research, knowledge and education. The Institute's mission to make a significant contribution by attracting, developing, inspiring and retaining exceptional people provides the base for research, knowledge creation and education. It has a unique capacity to address public policy issues through research in an objective, entrepreneurial and timely manner. The new knowledge created by the Institute team will provide private and public decision makers with the basis to deal with many aspects of change.

The research program of the Institute is focused on business, computer science, economics, engineering, logistics, operations research, planning and psychology. The staff members are productive, objective and timely. It is the most entrepreneurial organization of its type in the United States. The exceptional group at the Institute generates nearly $20 of other research support for every $1of general fund it gets appropriated each year.

The staff of the Institute is exceptional. I invite you to use this report as an introduction to the Upper Great Plains Transportation Institute – its exceptional people, cutting edge research program, its focus on education, and its service. The knowledge and services created by this exceptional group of people will do much to help North Dakota compete successfully in the global economy.

Upper Great Plains Transportation Institute
North Dakota State University

Vision

Enhance our reputation as one of the top university transportation centers in the United States.

Mission

Continue to make a significant contribution to small urban and rural transportation and logistics by attracting, developing, inspiring, and retaining exceptional people.

Programs Focus Areas

Director's Message

Gene Griffin

This past year saw several initiatives come to fruition that significantly advanced the Institute's mission of *"Continuing to Make a Significant Contribution to Small Urban and Rural Transportation and Logistics by Attracting, Developing, Inspiring, and Retaining Exceptional People*." Major accomplishments include:

- Creation of the Small Urban and Rural Transit Center
- Development of an Agriculture Transportation Center
- Establishment of an interdisciplinary Doctoral program in Transportation and Logistics
- Hosted a national conference on Agriculture and Transportation Linkages
- The addition of several qualified staff and quality space

Advancements in other programs also made important contributions to achieving the Institute's mission. The *Advanced Traffic Analysis Center* worked with state and local transportation agencies on improving traffic operations in Bismarck, Fargo, Grand Forks, and Minot. The *North Dakota DOT Support Center* provided hands-on experience for a number of students in designing transportation projects under DOT supervision (a number of these students went on to work in transportation at the ND DOT and engineering consulting firms). The *Transportation Safety Systems Center* developed and deployed Query Central, a web-based intelligent query system. Query Central consolidates real-time commercial vehicle, driver, and company safety information for use by Federal and State motor carrier safety specialists nationwide. The *TEL8 Distance Learning System* expanded its DOT district site network and facilitated the inception of a videoconference program network in the western United States. The *ND Strategic Transportation Program* evaluated the feasibility of an intermodal facility to serve North Dakota businesses and addressed the logistical issues facing the manufacturing sector.

These accomplishments furthered the vision of the Institute to *"Enhance Our Reputation as a Major Program of Excellence among the University Transportation Centers in the United States*." This was only possible because of a research, teaching, and support staff of exceptional quality. The staff, which total 30, with four additional affiliated staff from other universities are highly motivated and are the reason for the success of the Institute.

Students also play an important role in the accomplishments of the various programs. The Institute currently employs 22 undergraduate students and supports 18 graduate students at NDSU. These students make an invaluable contribution to the program. More importantly, they represent the future transportation leaders, researchers, educators, and practitioners for North Dakota and the United States.

The Transportation Institute has experienced another successful year of continued contribution to transportation through research, education, and service as evidenced by the projects in this annual report. It could not have been possible without the support of NDSU and the Institute's many partners. A great debt of gratitude is owed to all who have helped make this success possible.

Intelligent Transportation Systems

North Dakota's Intelligent Transportation Systems Plan • Ayman Smadi, Shawn Birst, Matthew Martimo (current)

The ATAC is assisting the NDDOT in conducting a major planning effort for developing a statewide comprehensive ITS plan. The NDDOT wants to better serve customers by providing timely and accurate information about road and weather conditions. The NDDOT has begun implementing statewide traveler information and is working on adding more ITS user services. This phase of the plan focuses on integrating various systems and identifying future deployment efforts. The ATAC is facilitating outreach activities to get consensus on the plan, providing technical assistance on system integrations, and developing the ITS architecture.

NDDOT's Fargo Traffic Operations Center • Ayman Smadi, Shawn Birst, and Matthew Martimo (current)

The ATAC is supporting the NDDOT Fargo District as well as other local partners to establish a Traffic Operations Center (TOC) for the Fargo area. The TOC is envisioned to be a virtual center for collecting, processing, and disseminating traffic, roadway, and incident information for the Fargo metropolitan area. The NDDOT is installing communications and support systems for the TOC along the I-29 and I-94 corridors. ATAC will support system analysis and provide technical assistance for integrating TOC functions among various agencies.

Travel Demand Modeling Support Program • Matthew Martimo and Ayman Smadi (current)

Proper transportation planning is key to achieving a transportation system which supports the vision and goals of communities — safety, mobility, economic opportunity, environment, and quality of life. Transportation plan development is not a straight forward process due largely to the dynamic relationship between transportation and land use, which can best be characterized as complex. As a result, the level of resources (staff and funds) available to a Metropolitan Planning Organization directly impacts the model quality. The three MPOs in North Dakota, as well as the NDDOT, have experienced a shortage of qualified staff to develop and operate transportation models. ATAC developed this program in partnership with the NDDOT, Bismarck, Fargo, and Grand Forks to support modeling needs in North Dakota, using enhancements to the Fargo-Moorhead MPO as the focal point of this effort. The ultimate goal for this program is to develop a resource for transportation planning modeling suited for small to medium size urban areas.

Technical Assistance • Shawn Birst, Matthew Martimo, Ayman Smadi (current)

ATAC provides support to local and state transportation agencies through the use of ATAC staff expertise, traffic analysis capabilities, and traffic data collection equipment. ATAC researchers are working on several projects to analyze various design options, investigate intersection traffic operations, and improve traffic flow. These projects have been conducted in Bismarck, Fargo, Grand Forks, and Minot, North Dakota, as well as Moorhead and Alexandria, Minnesota. ATAC also provides assistance to the transportation community by providing training programs (Synchro and VISSIM). Tools developed by ATAC add value to existing analysis programs and streamline the analysis process.

Signal Coordination Strategies: Case Study of Grand Forks, North Dakota • Kiel Ova and Shawn Birst (completed)

This study examined traffic signal coordination strategies using a corridor with atypical intersection spacings. The Washington Street corridor (5th Ave N to 32nd Ave S) in Grand Forks, ND was used as a case-study location for these analyses, evaluating three time periods (AM, MID, and PM), for two potential interconnect scenarios. The study developed signal timing plans using four traffic analysis models (Synchro, PASSER, TRANSYT-7F, and TEAPAC) and evaluated the performance of these plans using three traffic simulation models (CORSIM, SimTraffic, and VISSIM). The analysis also evaluated the performance of coordinating traffic signal operations for the whole corridor vs. splitting the corridor into two coordinated segments.

Logistics & Rural Economic Development

Strategic Freight Analysis Program for North Dakota - Manufacturing • Mark Berwick, John Bitzan, Junwook Chi, Mark Lofgren

North Dakota can be proactive and make decisions regarding the nature of the evolving transportation environment, or the state can let decisions be made for them. North Dakota needs to be the master of its own destiny, to the extent possible, in the evolution of the transportation system that serves manufacturing, agricultural production and processing.

The North Dakota Biennial Strategic Freight Analysis Program focuses on important areas in transportation for the state. The objective of the project is to gather information and data for the decision makers in the state. For this biennium there are six topic areas concentrated on manufacturers, processors and specialty agriculture producers.

The aim of this project is threefold: 1) Strengthen the North Dakota manufacturing sector by advancing a competitive advantage through the application of supply chain management and business logistics. 2) Provide the information and analysis necessary to establish a viable intermodal container freight facility to serve all North Dakota businesses. 3) Improve public policy by providing industry leaders and public policy makers with a better understanding of industry transportation and logistical needs.

The first goal of this project is to make an assessment of the transportation and logistics environment faced by North Dakota manufacturers. A second goal is to evaluate emerging trends in the application of transportation management, logistics, and supply chain management and their application in manufacturing. A third goal is to develop the human capital required to effectively manage transportation and logistics. A final goal is to evaluate the intermodal infrastructure requirements and feasibility for all sectors of the North Dakota economy. Gathering data and evaluating trends in transportation and transportation infrastructure will provide for better management and decision making which will enhance economic development in the state. Providing training and information to manufacturers and carriers may provide a new found competitive advantage for manufacturers and specialty agriculture producers. This project will continue to develop a strategic freight transportation analysis focused on the critical role of transportation and logistics in North Dakota.

Keys to Developing an Intermodal Facility In North Dakota

Many parties have expressed a strong interest in developing a highway/rail intermodal container transportation facility. The development of a successful facility will require someone or an entity to take a strong leadership role. It will also require a cooperative effort among federal, state, and local governments, economic development groups, railroads and other transportation companies, manufacturers and specialty agricultural producers. This effort may include such actions as:

1. Pursuing state enabling legislation allowing for creation of a port authority for communities and regions
   - Bonding authority
   - Power to tax

2. State legislation allowing joint state/local funding cooperation for non-highway components
   - Start-up grant from state or federal sources
   - Low-interest loans

3. Local community support for creation of a diversified shipping/business model

4. Commitments and Cooperative Effort
   - Commitment of rail carriers for rates and service
   - Commitment of a jurisdiction (city, state, county and rail)
   - Cooperation among states and provinces
   - Commitments from shippers and third party transportation providers

5. Specific site analysis
   - Business plan
   - Engineering plan

6. Creation of an outreach program educating shippers about intermodal transportation using an internship program and other educational methods.

Rural Aviation

Airfares to Small and Medium Sized Communities • John Bitzan (current)

The purpose of this study is to evaluate the pricing behavior of airlines operating in small and medium size markets. Our nationwide study of airline pricing behavior makes an assessment of the reasons for differences in fares across markets, with a focus on small and medium sized communities. Our study will include: (1) a comprehensive survey and review of literature related to airline pricing, (2) a careful examination of airline pricing behavior nationwide, with segregation by market types and the number and types of airlines serving various markets, (3) development of a detailed, theoretically sound, and testable economic model to explain airline pricing behavior, (4) development and estimation of econometric models to test the hypotheses developed by the economic model, and (5) a summary of results, along with a discussion of the implications of our findings for desirable policies that maximize social welfare.

Motor Carrier Safety, Economics & Management

Commercial Vehicle Roadside and Investigative Systems Software Development • Brenda Lantz, Gary Talpers, Tim Brown, Dottie West, Carl Alyea, Peggy Kaiser, Kathy Short (current)

This project involves the development and maintenance of software systems used by Federal and State motor carrier safety specialists, as well as private industry professionals. Since 1996, many interrelated roadside, investigative, and analytical software programs in use nationwide have been developed. These systems are considered to be mission critical to the Federal Motor Carrier Safety Administration (FMCSA), and are steadily updated and refined to reflect regulatory changes, enforcement policy changes, as well as computer technology changes. The specific software programs include:

(1) ASPEN Driver/Vehicle Inspection Software: This is the driver/vehicle inspection software used by most states and the FMCSA. ASPEN runs on laptops and is used to collect inspection details and print the inspection report. It includes communication features to electronically transfer inspections to national information systems.

(2) ISS (Inspection Selection System) Development and Software: This is the primary tool used on the roadside to screen motor carrier vehicles and determine the usefulness of conducting an inspection. ISS returns the carrier snapshot which includes many critical safety performance indicators. It is linked which ASPEN to auto-populate name and address data fields and initiate the inspection. It uses a local database which is refreshed weekly via SAFER. It can also operate as an online query tool.

(3) PIQ (Past Inspection Query) Software and Communications: PIQ accesses a national database of recent inspection reports (those done within the last 60 days), and retrieves copies and summaries. It allows checking for unrepaired defects and driver hours problems.

(4) CDLIS (Commercial Driver License Information System) Access Software: This is software for retrieving driver status and conviction history reports from CDLIS. It is coupled to ASPEN and CAPRI, but can be operated as stand-alone software as well.

(5) CAPRI Software Documentation, Compilation, and Installation Programming: This software is used for preparing standard Compliance Reviews as well as specialized cargo tank facility reviews, and HM shipper reviews. CAPRI includes worksheets for collecting (a) hours of service data, (b) driver qualification data, and (c) drug and alcohol compliance data. It also creates the preliminary carrier safety fitness rating and various reports to motor carriers.

(6) CaseRite Software: This program allows the creation of legal enforcement cases for Federal prosecution of FMCSR and FHMR violations.

(7) UFA (Uniform Fine Assessment) Software: This software allows calculation of a uniform and reasonable fine amount based on the nature of the violations and the various criteria set forth in the FMCSR. UFA is optimized for Federal fine structures and is used with CAPRI and CaseRite.

(8) ProVu Software: ProVu is a viewer which allows Federal, State, and private industry users to electronically analyze standard motor carrier profile reports available from the FMCSA. This application displays nearly every data element found on the hard-copy version of the carrier profile in an easy-to-understand format which can be sorted, filtered, and optimized by users.

(9) QC (Query Central): QC uses the latest web-based technology to consolidate inspector queries on drivers, vehicles, and carriers into a single "intelligent" request. It internally obtains data from several sources, analyzes it, and builds a prioritized report which identifies any past safety or operational problems.

(10) FMCSA Information Systems web site development: Located at http://infosys.fmcsa.dot.gov, this site is used to distribute information and software for FMCSA users and their state partners.

An Analysis of Commercial Vehicle Driver Traffic Conviction Data to Identify High Safety Risk Motor Carriers • Brenda Lantz (current)

This project explores the idea of using commercial motor vehicle driver traffic conviction data from the Commercial Driver License Information System (CDLIS) to better identify high safety risk motor carriers. CDLIS data is the only existing nationwide source of traffic conviction data. CDLIS is not really a single database, but a linkage between the various distributed state driver records systems. Its successful use as a pointer to high risk motor carriers would eliminate the need to create a new national driver citation/conviction information system. Serious institutional barriers have thus far prevented creation of any such data collection system. The most critical problem with using CDLIS data in this way is that it also does not identify motor carriers employing the driver.

This study uses computer technology to link drivers to motor carriers from their inspection and crash records, and then queries the driving records from CDLIS. An analysis of the drivers' traffic conviction records is conducted and a relative driver quality index is derived for each motor carrier. This index is then compared against the company's crash and inspection history to determine if a correlation exists. In addition, "high risk" carriers identified through this process are compared with those identified through other FMCSA prioritization techniques. Recommendations are given for possible ways that FMCSA could use this information to help improve the effectiveness of their enforcement programs.

This study uses computer technology to link drivers to motor carriers from their inspection and crash records, and then queries the driving records from CDLIS. An analysis of the drivers' traffic conviction records is conducted and a relative driver quality index is derived for each motor carrier. This index is then compared against the company's crash and inspection history to determine if a correlation exists. In addition, "high risk" carriers identified through this process are compared with those identified through other FMCSA prioritization techniques. Recommendations are given for possible ways that FMCSA could use this information to help improve the effectiveness of their enforcement programs.

Railroad Operations & Economics

American Short Line Railroad Database • Doug Benson (current)

The American Short Line Database completed its sixth year. This project continues to develop an industry database for use in public policy discussions and other areas impacting short line railroads. Additional work this past year included the preliminary development of time-series short line industry estimates. The project is updated annually and is anticipated to be a long-term effort of the Institute.

Small Railroad Investment Needs and Financial Options • John Bitzan, Doug Benson, Denver Tolliver (current)

This project has the following objectives: (1) identify potential financial performance measures that might assist commercial lenders in making credit available to short line and regional railroads; (2) evaluate the role of light density rail lines in the national transportation system, including their unique function with respect to certain types of industries and certain types of commodities; and (3) demonstrate the extent to which light density railroad freight services relate to the U.S. Secretary of Transportation's responsibilities for providing fast, safe, efficient, and convenient transportation at the lowest cost.

Updating the Uniform Rail Costing System Regressions • John Bitzan, Denver Tolliver (current)

The accuracy of the entire URCS process depends on the accuracy of the Phase I regressions, as these are used to estimate the percent of various cost accounts that are variable. The regression coefficients used to estimate cost variability in URCS reflect 1978-1985 data. Many mergers have occurred since then, and many changes have occurred in the locomotive fleet, traffic control, and other aspects of railroad operations. Many smaller railroads – including some beltway railroads – were included in the 1978-1985 data set. None of the railroads in the 1978-1985 data set approaches the size of the BNSF, the UP, and the CSX and NS systems of today. Because of the concentration that has occurred since 1985, the Class I industry of today may exhibit different characteristics than the industry of the early 1980s. It is important to know if the cost variabilities used in URCS are still reflective of the Class I industry. This study aims to re-estimate the URCS regressions using current data.

Costs, Pricing, and Regulatory Alternatives for Mergers • John Bitzan, Wesley Wilson (current)

Recently, there has been a wave of mergers in the U.S. rail industry. These mergers have included those by the Burlington Northern and Sante Fe Railroads, the Union Pacific and Southern Pacific Railroads, and Conrail with the CSX and Norfolk Southern Railroads.

A recent study sponsored by the Federal Railroad Administration (FRA) found that railroads are natural monopolies when the alternative to a merged railroad is duplicate side-by-side rail networks, but that rail mergers extending the size of rail networks lead to increases in railroad costs. This suggests that further end-to-end mergers are not beneficial unless significant service improvements are obtained.

While the study provides a useful starting point for examining the welfare implications of railroad mergers, it does not provide a detailed analysis of specific rail mergers that have occurred, an assessment of the pricing effects of mergers, or an assessment of the impacts of mergers on service.

This study will build upon the findings of the FRA study and others to provide a detailed analysis of previous rail mergers in terms of costs, pricing, and service, and to discuss the implications of these findings for the future of regulatory oversight of mergers.

The Differential Effects of Deregulation on Rail Rates • John Bitzan, Kimberly Vachal (current)

It is well documented that railroad deregulation in the U.S. has been successful. Studies have shown increased productivity, decreased rates, and increased profitability in the rail industry as a result of deregulation.

However, general evidence suggests that while railroad deregulation has benefitted shippers overall, through continued rail viability, rate savings, and improved service, the benefits have not been evenly shared. For the most part, the effects of deregulation on shippers and carriers have been well documented. However, one component of past regulatory change that is not well documented is the extent of differential rate changes that have been realized as a result of deregulation. A study by Wilson (1992) examines the asymmetric effects of deregulation on rates for 34 general commodity classifications, and finds differential effects among commodities. Nonetheless, the study does not assess the differential effects of deregulation on shippers with different transportation options shipping the same commodity. This study investigates the rate structure in the rail industry, and how it has changed as a result of deregulation, highlighting the differential impacts that deregulation has had on rates among commodities, regions, and over time.

Costing Individual Rail Movements • John Bitzan, Wesley Wilson (current)

Currently, the Uniform Railroad Costing System (URCS) is used to identify individual movement costs. This system, developed by the Interstate Commerce Commission, uses a series of regression equations for individual railroad cost accounts to identify the portion of each account's costs that are variable. Although the system provides some of the best public costing information available for any industry, it still may be improved upon. While URCS takes a "practical" approach to costing individual movements, it does not allow for the flexibility that is provided by the more aggregate approach used in the academic literature. The general objective of the proposed research is to document, compare and evaluate the procedures used to estimate costs and, in particular, to estimate the costs of an individual movement. To this end, there are several specific objectives. These include:

1. A review of the advantages and disadvantges of the two approaches generally used to estimate costs. This review will take into account academic concerns and practical costing needs.

2. A comparison of cost estimates at the individual movement levels. URCS cost estimates for individual movements will be compared with cost estimates using an econometric approach (each of the authors have published research, using R-1 data to estimate cost functions). The results will allow for a comparison of levels across methodologies as well as an examination of the relationship between the two estimation procedures across identifiable traffic characteristics.

Transit

Transportation of the Less Fortunate • Jill Hough (forthcoming)

There are individuals in North Dakota facing challenging mobility issues. This study will document transportation needs of the less fortunate in hopes of better meeting their requirements for a more fulfilling life.

Bus Rapid Transit: An Examination of Political Feasibility Using Case Studies • Jill Hough (current)

Many cities in the United States would like to implement light rail service. However, the high implementation cost impedes many cities and forces them to look for alternative transportation options. As a result, several cities are considering Bus Rapid Transit (BRT). A BRT system is a progressive transit system that makes use of buses. The buses usually operate in a designated bus lane, but may also operate segments with fixed traffic. Furthermore, the BRT system makes use of technologies to further increase efficiencies of serving the clients, e.g., signal priority, precision docking, etc. The system is much like a light rail system, except it can be implemented and maintained at a fraction of the cost.

This project is using a case study approach. Four cities will be selected and in-depth interviews and surveys will be conducted in each of the cities. Interviews of transit managers and key city officials will be conducted to identify key political factors that may impede or support BRT. In addition, surveys of transit employees and other local officials, along with city residents, will be conducted to identify their perceptions of the factors involved in the selection of BRT for the city. Economic factors will be evaluated primarily through budgets and revenue forecasts.

ITS Transit Applications Used to Facilitate the Welfare to Work Program • Jill Hough (MPC Report 02-131, May 2002)

This study documents the ITS technologies used by transit systems throughout the United States. Transit systems were surveyed to identify the ITS applications being used and to understand the transit managers' perceptions of the usefulness of the technology.

Rural Roads & Bridges

County Road Planning Workbook • Jill Hough, Gene Griffin, (current)

The objective of this study is to develop a workbook to assist counties in the road planning process. This is particularly important due to shrinking resources and increasing costs counties and townships must address. A case study approach has been taken to develop the workbook. Counties in northern California and North Dakota are included in the development and testing of the planning process.

An Assessment of Road User Needs in Region 8 States • Jill Hough (forthcoming)

This study will document any differences in the perceptions of rural road users' needs and rural road providers' perceptions. A difference in perceptions would provide decision makers an opportunity to re-evaluate future rural road decisions and policy.

Miscellaneous

An Evaluation of Region 8 State Departments of Transportation and Metropolitan Planning Organizations GIS Technology Application • Rob Arthur, Doug Benson (current)

GIS resources have become an important tool for transportation analysis and require effective management to fully utilize its technology. This study will identify and assess the current state of GIS in the region's DOTs and MPOs, and develop a resource tool outlining potential areas of coordination and cooperation among GIS users. Additionally, the study will identify GIS resources available for transportation researchers in the region.

Mountain-Plains Consortium

Denver Tolliver
Program Director

The Mountain-Plains Consortium (MPC) is a four-university consortium for the development of a transportation education, research, technology transfer and service program. North Dakota State University is the lead university for the Consortium and the Upper Great Plains Transportation Institute is the administrative home and fiscal agent for the program. The other three universities are the University of Wyoming, Colorado State University and the University of Utah. The MPC is one of 10 competitively selected university transportation centers located throughout the United States in each of the 10 federal regions. MPC represents Region 8, which includes North Dakota, South Dakota, Montana, Wyoming, Colorado and Utah. The program is funded on a 50-50 matching basis by the U.S. Department of Transportation.

In 2001-02, the MPC continued its strong tradition of distance education. The University of Utah and North Dakota State University offered distance education degree programs for state transportation department employees using interactive video and internet-based media.

The MPC continued its strong research effort in 2001-02, publishing 13 new peer-reviewed reports:

1. U.S. Containerized Grain and Oilseed Exports - Industry Profile
2. Intelligent Transportation Systems: Helping Public Transit Support Welfare to Work Initiatives
3. Utilizing the Long-Term Pavement Performance Database in Evaluating the Effectiveness of Pavement Smoothness
4. Safety Analysis Without the Legal Paralysis: The Road Safety Audit Program
5. Analysis of Economies of Size and Density for Short Line Railroads
6. North Dakota Strategic Freight Analysis: Summary Report
7. North Dakota Strategic Freight Analysis: Heavier Loading Rail Cars
8. North Dakota Strategic Freight Analysis: Shuttle Trains
9. North Dakota Strategic Freight Analysis: Logistical Factors Influencing the Success of Value Added Processing Facilities
10. North Dakota Strategic Freight Analysis: Intermodal Highway/Rail/Container Transportation in North Dakota
11. Shear Key for Strengthening Bridges
12. Field Load Tests of Open-Deck Timber Trestle Railroad Bridges
13. The Long-Term Availability of Railroads Services for U.S. Agriculture

Advanced Traffic Anaysis Center

Ayman Smadi
Program Director

Mission: Enhancing transportation systems in small to medium size cities through the use of advanced traffic analysis tools and ITS solutions to safety and mobility problems.

The Advanced Traffic Analysis Center (ATAC) was established in 1998 as a technology support center to address transportation needs and issues of small to medium size communities. The main focus of ATAC activities is to improve mobility and safety in those communities by taking advantage of advanced technologies, the application of powerful traffic analysis tools, effective training, and information dissemination.

Small to medium size cities are home to about 25 percent of the U.S. population (or roughly over 50 million residents). They provide critical economic, social, health, cultural, and shopping opportunities for vast surrounding rural areas. It is not surprising that these areas also experience the largest population growth, and as a result, increased traffic congestion. However, these cities generally have to work with modest resources in order to meet the increasing transportation challenges in their communities. A recent report to the Committee on Transportation and Infrastructure of the U.S. House of Representatives emphasized how traffic congestion is clearly a problem that is not restricted to large cities. While traffic congestion almost doubled in the largest metropolitan areas in the U.S., the small and medium size cities experienced over a four-fold increase in delay.

The ATAC program was developed with those challenges in mind and is guided by extensive input from local, state, federal, and private sector partners. The analysis capabilities that have been developed at the ATAC are valuable for supporting various transportation decisions, ranging from evaluating proposed roadway designs to enhancing traffic operations. ATAC researchers have also been working on making the use of analysis tools easier and more accessible to a wider audience of transportation professionals. An example of these efforts is the development of software enhancement tools for the CORSIM traffic simulation model that facilitate analyzing multiple scenarios, extracting the output for the user, and performing statistical analysis to summarize the results. Training and technical assistance activities continue to be a major focus of the ATAC program which support the three specialty areas of traffic operations, ITS, and travel demand modeling.

The ATAC's main resources are the qualified individuals who are capable of applying traffic analysis software and the expertise to address today's transportation challenges. Over the summer of 2002, ATAC moved to Hastings Hall where it has about four times the space than the previous location. ATAC's Traffic Laboratory houses computer hardware and software used for the analysis and serves as the ATAC training facility. The lab provides hands-on opportunities for exploring various traffic control strategies using traffic signal controllers in combination with traffic simulation. ATAC's Traffic Data Collection System uses video detection technology for acquiring the needed data to support various analysis needs. The system was used in several North Dakota cities, as well as Moorhead and Alexandria, Minnesota, to collect traffic data.

ATAC is adding a new full-time position to support its travel demand modeling activities. The ATAC also continues to attract high quality students from civil engineering, communications, computer science, and electrical engineering departments at NDSU. ATAC researchers have access to a wide range of expertise in both students and faculty, which allows them to expand potential research areas and better serve customers.

For more information please visit the ATAC's web site (www.atacenter.org).

Doug Benson
Program Director

TEL8 is a Federal Highway Administration (FHWA) Region 8 telecommunications system dedicated to transportation. Nine sites participated in the system in 2001-02 including five state departments of transportation (DOTs) in North Dakota, South Dakota, Montana, Wyoming, and Utah; and four Mountain-Plains Consortium (MPC) universities consisting of Colorado State University, North Dakota State University, University of Utah, and University of Wyoming. TEL8 established a unique partnership among the region's DOTs and the MPC transportation research universities with each partner providing programming, training, and technology transfer to the network. The system is governed by a board of directors with representatives from each of the DOTs and MPC universities and the FHWA regional office.

TEL8 expanded its network again the past year. Additional Department of Transportation (DOT) district sites were tested and added to the system bringing the total number of sites affiliated with TEL8 to 30. Moreover, the DOT district sites significantly increased their on-line participation in the network, almost doubling their TEL8 bridge activity.

Recently added programming continued to be offered and evaluated. The MPC short course program is developed at the MPC universities for video conference delivery to DOT participants. The MPC-X seminar program reporting MPC-sponsored trans-portation research results to the network continued its development. MPC-X seminars offered over TEL8 included a traffic analysis of the 2002 Winter Olympics and a presentation on Modeling Land Use Relationships.

Existing programming experiencing growth included increasing the MPC offerings to seven, the Leadership Development workshops to eight, and improving the sign-in and evaluation database. Programming participation, as measured by the number of people on the system and the time involved in programming, increased over 15 percent. As well, the bridge activity in the network increased significantly, growing by more than 50 percent.

Info-X and Trans-X remain popular DOT programming. Trans-X is a DOT developed program focusing on specific DOT departments and complements the more general information exchange series, Info-X. Each of these programs are led by a program coordinator located at one of the original TEL8 sites.

TEL8 facilitated the initiation of WASHTO-X this past year. WASHTO-X is modeled after TEL8, particularly TEL8's Info-X and Trans-X programs. WASHTO-X started a monthly video conference program across several of the western United States during the summer of 2002. TEL8 resources remain available to this new, developing network.

Department of Transportation Support Center

Dennis Jacobson
Program Director

Fiscal year 2001-2002 marked the second anniversary of the DOT Support Center. The program was continued by the North Dakota Department of Transportation due to the immediate positive impact on their engineering and information technology programs.

In the student-engineering program, several students accepted intern positions and worked on real-world engineering designs under the supervision of a North Dakota Department of Transportation designer. Numerous projects were completed which covered the gamut of transportation engineering. These types of projects included, hot bituminous paving, interstate reconstruction, concrete pavement repair and maintenance seal coats. Engineering students also participated in specific engineering research projects. One student, Matt Gangness, completed a study of the economics and design standards for drainable bases in North Dakota. Another research project is still in progress and deals with the geometric standards applicable to interstate median crossover designs.

Currently, the student engineering center has nine student employees. The NDDOT has hired and placed another engineer, Matt Linneman, in the center to assist the head designer, Ron Henke. Matt is a former student engineer. He was hired in January prior to graduation, along with Stephanie Weigel, another former student engineer. Mark Vizecky was hired by NDDOT as a geotechnical specialist in August. He will be classified as a geotechnical engineer upon graduation from the NDSU Civil Engineering program in December 2002. The student engineer intern program has been an outstanding success. All students are proficient in Microstation and in plan development standards. They have proven to be excellent employees while in college and more importantly, after graduation.

Another successful program has been the student information technology center. This past year, another employee was added to the staff to supervise this function. Kellee Kruse is now the full time supervisor of this activity. Kellee was an initial student intern in the IT center program. She graduated in the spring of 2002 and came into the program full time. Kellee plans to start a masters degree program in the spring 2003 semester. She is currently finishing an exciting Mountain-Plains Consortium project that combines global positioning (GPS) and personal data assistant (PDA) technology to provide enhanced field data input to NDDOTs maintenance management system. Seven IT students worked in the center during the spring semester and four full time interns were employed during the summer semester. Currently, there are three students working on numerous projects. Some of the projects include a web project to streamline plan notes and standard drawings, engineer production management through Microsoft Project, geographical information systems, and numerous database applications. This is an exciting field that is growing rapidly. Close coordination is required between NDDOT Information Technology Division director, Doug Faiman and his field analyst, Susan Reule. All student projects were completed on time. The next work program is currently being developed.

Dennis continues to work on his doctoral degree while managing all of the activities of the center. He completed research projects on roles and responsibilities for transportation management and the economic impacts of transportation. Both reports were in support of NDDOTs strategic transportation planning efforts. Dennis also completed three papers concerning improving the ride quality of North Dakota's roadways. This pavement smoothness initiative is a key objective of the NDDOTs Strategic Business Plan and will require a continued effort by DOTSC in the next program year.

Transportation Safety Systems Center

Brenda Lantz
Program Director

Since 1996, the UGPTI has operated a specialized software development center in Lakewood, Colorado, primarily to develop and maintain mission-critical front-end software for use by State and Federal motor carrier safety specialists nationwide. This center has evolved into the current Transportation Safety Systems Center (TSSC), with the ultimate goal remaining the same – to improve the safety of our nation's highways. The program helps to accomplish this goal through its software development, as well as through research, training, and education.

The continuing success of the program is made possible through grants from the Federal Motor Carrier Safety Administration (FMCSA) to the North Dakota Highway Patrol (NDHP) under the Motor Carrier Safety Assistance Program. The NDHP partners with the UGPTI to maintain the program.

There are currently eight full-time research staff that comprise the program. These include the program director and analyst, four software programmers and developers, a quality assurance and software test person, a computer network and hardware person, and an administrative assistant and web site developer. The staff work closely with the FMCSA staff, primarily in the Information Systems division, who provide overall strategic direction and advice of policy changes.

The software developed through the program can be divided into two broad areas – roadside systems and investigative systems. The roadside systems include:

(1) the overall driver/vehicle inspection software, ASPEN, that collects the inspection details and transmits the data to national information systems;

(2) the Inspection Selection System that provides an inspection recommendation as well as a carrier snapshot;

(3) the Past Inspection Query that has the capability to retrieve previous inspection reports for a particular vehicle or driver from the last 60 days; and

(4) the Commercial Driver License Information System Access software that can retrieve a driver's status report and their conviction history.

The investigative systems include:

(1) the overall carrier compliance review software, CAPRI, collects the review details, prepares various reports and the preliminary carrier rating, and transmits the data to national information systems (this software is developed through another contractor, but the TSSC is responsible for the documentation, compilation, and creation of the install program);

(2) the CaseRite software helps to create legal enforcement cases for Federal prosecution of regulation violations;

(3) the Uniform Fine Assessment software calculates uniform and reasonable fine amounts based on the nature of the violations and other various criteria; and

(4) the ProVu software allows Federal, State, and private industry users to electronically analyze standard motor carrier profile reports available from the FMCSA.

In addition to maintaining these software programs, the TSSC is currently involved with two new research and development projects. The first project, Query Central, uses the latest web-based technology to consolidate inspector queries on drivers, vehicles, and carriers into a single "intelligent" request. It internally obtains data from several sources, analyzes it, and builds a prioritized report which identifies any past safety or operational problems.

The second project explores the idea of using commercial motor vehicle driver traffic conviction data from the Commercial Driver License Information System to better identify high safety risk motor carriers. It is anticipated that this information will help improve the effectiveness of FMCSA's enforcement programs. Throughout the year, the staff is also involved with numerous presentations and training sessions to educate users and other interested parties about the software developed and the research conducted.

Small Urban and Rural Transit Center

Jill Hough
Program Director

The Small Urban & Rural Transit Center (SURTC) was established in May 2002. The purpose of the Transit Center is to work to improve the mobility and accessibility of rural and small urban city residents through rejuvenated public transportation. The three elements of the Center are research, education, and training and outreach.

Program Areas
The research undertaken at SURTC will look particularly at social equity, transit ridership, improved technology and air quality. The Center will provide information to the transit agencies, businesses and communities to provide a link among transit users, transit providers, businesses and researchers.

The Center will provide and facilitate the exchange of information relevant to the transit industry. There will be a special focus on planning, operations and technologies emphasizing smart solutions to problems.

Training programs will be developed to specifically address small urban and rural transportation issues. Additionally, SURTC will work with NDSU faculty members to develop and incorporate public transit into their curriculum.

The states targeted by SURTC are North Dakota, South Dakota, Montana, Wyoming and western Minnesota. The populations in these states are distributed among a few small urban cities and vast rural areas. In addition, these states have a large proportion of elderly and disadvantaged citizens. Transit services in these states are also under-funded relative to transit systems in large urban areas. SURTC will bring attention to this imbalance and work to meet the needs of rural and small urban areas.

Partnerships
The SURTC is coordinated with federal, state, and local transportation partners. Key partners include the Federal Transit Administration, Community Transportation Association of America, American Public Transportation Association, and state transit associations. SURTC will coordinate efforts with other UGPTI programs including the Mountain-Plains Consortium, the Advanced Traffic Analysis Center, and TEL8.

Steering Committee
SURTC has a steering committee comprised of individuals from the DOT's and transit agencies in each of the states mentioned above, as well as national representatives from the Federal Transit Administration (FTA), the Community Transportation Association of America (CTAA) and the American Public Transportation Association (APTA) from Washington, D.C. The steering committee's role is to provide guidance to SURTC.

SURTC Staff
Jill Hough is the Director of the Center; Gary Hegland is an Associate Research Fellow; Jim Miller is an Affiliated Faculty member from Penn State who is working from a distance with the Center; Patrick Nichols, is the web communications manager (Patrick maintains all of the websites affiliated with UGPTI); and Crystal Bahe is an undergraduate student research assistant majoring in sociology.

For additional information about SURTC, please visit the website www.surtc.org.

Graduate Transportation Options

Denver Tolliver

The UGPTI continues its educational partnerships with the Departments of Agribusiness and Applied Economics and Civil Engineering & Construction, and the College of Business Administration. MS degrees are offered in Agribusiness and Applied Economics and Civil Engineering with options in Transportation. Students pursuing the MBA degree can take two transportation courses as technical electives.

The Transportation Option in Civil Engineering includes a distance education program which allows students at the NDDOT in Bismarck to enroll in the graduate program. In the distance education program, NDSU exchanges courses with Colorado State University, University of Utah, and University of Wyoming. MPC funding is used to support graduate students in several departments.

On June 20, the North Dakota Board of Higher Education approved a proposal for a new interdisciplinary doctoral degree in Transportation & Logistics. This marked the culmination of a two-year process of program development and committee and peer review. The Transportation & Logistics degree is a joint effort of the Colleges of Agriculture, Business Administration, and Engineering & Architecture, and the Upper Great Plains Transportation Institute. The following departments are participating in the program: Agribusiness & Applied Economics, Civil Engineering & Construction Management, Industrial & Manufacturing Engineering, Marketing & Finance.

The program consists of a core curriculum of 25 credits, an area of concentration, and a dissertation. Students may enroll in one of three areas of concentration: (1) Logistics and Supply Chain Systems, (2) Transportation Economics and Regulation, and (3) Transportation Infrastructure and Capacity Planning. The core curriculum includes two courses in Transportation Systems and one course each in: Logistics and Distribution Management, Intermodal Freight Transportation, Spatial Analysis of Transportation Systems (which includes a GIS-transportation lab), Quantitative Modeling, Probabilistic and Deterministic Methods, and Transportation and Logistics Research. The program also includes new courses in Economics of Transportation Systems, Transportation Corridor Planning, Public Transportation, Public Infrastructure Management, and Facilities Location.

The first class of 6 doctoral students enrolled in the fall of 2002. These students are funded primarily through MPC stipends.

Annual Awards Banquet

The Upper Great Plains Transportation Institute at North Dakota State University held its annual awards banquet Thursday, October 11 at the Fargo Holiday Inn.

Recipients of the John Agrey Award for outstanding individual contributions in the promotion of North Dakota transportation were Jack K. Daniels and the late Melvin G. Maier, former administrator of the North Dakota Wheat Commission.

The UGPTI awarded four undergraduate scholarships, which included a $1,500 stipend for the academic year. Funding for the scholarships is provided by the Mountain-Plains Consortium through a grant from the U.S. Department of Transportation University Transportation Centers program.

The Paul E. R. Abrahamson Scholarships were awarded to Jody Wosick, daughter of Arthur and Joane Wosick of Minto, N. Dak., and Kelly Schlauderaff, son of Gary and Barb Schlauderaff of Detroit Lakes, Minn.

Engineering scholarships were awarded to Nate Larson, son of Robert and Cheryl Larson of Wahkon, Minn., and Nancy Molick, daughter of Paul and Mary Molick of Moorhead, Minn.

Research Staff

Rob Arthur

Mr. Robert Arthur has been involved in transportation research over the last 7 years. During that time he has worked as a research associate for The Van Horne Institute, a transportation institute based at the University of Calgary and serving all modes of the Canadian transportation industry. Specifically he worked on the Global Crossroads Study which focused on improving the penetration of Canadian transportation into the global economy. He has also been a member of the Alberta Motor Association's Speed Management Committee.

He has researched the role of speed in traffic collisions extensively, exploring all aspects of road safety. His publications include articles in an international journal and numerous conference proceedings. He has also presented at many conferences on GIS and traffic safety. He has written a chapter concerning the use of GIS in the research of traffic safety for a soon to be released book containing articles from authors worldwide and has written an instructor's manual for use with a Human Geography textbook.

He has taught courses in Geography at several Universities and Colleges in Alberta, Canada and has just recently been appointed to the Department of Geosciences at North Dakota State University.

Doug Benson

Leading the half million dollar technological reconfiguration of the TEL8 network, Douglas Benson assures the six-state videoconference network will aid effective transportation education. In addition to the TEL8 network, he led the national effort in the western United States for videoconferencing the Transportation Research Board national meeting for 12 states. Devoting 14 years to transportation research, Benson partners his computer science skills with various transportation modes.

Since 1997, Benson has been executive director for TEL8, an organization that incorporates State Departments of Transportation (DOT) and universities dedicated to transportation research. TEL8 saves funding for training and travel costs by electronically linking the nine sites in the system. This provides education and training opportunities not otherwise available, including TEL8 videoconferences with two secretaries of transportation and other national organizations.

Benson combines his work on short line railroads with his responsibilities as program director for the National Short Line Database. He coordinates many agencies and does economic analyses for major organizations concerned with the economics of railroad systems. His involvement with Class I railroad database systems has helped bring efficiency to the reporting requirements for the database.

Information developed from the National Short Line Database has been used in Congressional hearings for the general development of public policy on railroads.

Among his experiences in computer science, he did operational evolutions of United States military computer systems.

Benson's interest in computerized transportation analysis, railroad operations, developing transportation databases and applications is supported by his education. He holds four bachelor of science degrees from the University of North Dakota and a master of science degree in computer science from North Dakota State University.

Mark Berwick

An associate research fellow, Mark Berwick studies logistics and economic development in transportation, particularly trucking. His study in motor carrier economics aids the industry in planning and development. The logistics of his work show the movement and information associated with a product from raw material to the end-user and back.

Since 1997, when he joined the Upper Great Plains Transportation Institute, Berwick has been the principal investigator on four Mountain-Plains Consortium projects and is the project leader for logistics and economic development.

His expertise in trucking leads to intermodal transportation options with rail carriers. Berwick is researching the potential for locating intermodal facilities on short line railroads. Through his work he develops concepts for mountain and plains manufacturers and processors, as well as evaluating the feasibility of developing a jointly owned, third party logistics firm in North Dakota. Cost undergirds his research, helping the transportation industry develop both domestic and international shipping potentials in a fine-tuned marketing strategy. (continued on next page)

His personal business experience gives him an edge in research. Before joining the Institute he operated his own businesses. This gives him a unique vantage point from which to develop the logistics and economic development program at the Institute.

He has also been an instructor in the department of agribusiness and applied economics, teaching a logistics and transportation management course.

Berwick holds a bachelor of science degree with a major in agricultural economics and business and a master of science degree in agribusiness and applied science with an emphasis in transportation and logistics, both from North Dakota State University. He also holds an associate arts degree from the University of North Dakota, Williston, in marketing and management.

Shawn Birst

Shawn Birst provides technical assistance in advanced traffic analysis tools for the Advanced Traffic Analysis Center (ATAC). Birst primarily works with transportation operational improvements using traffic signal optimization programs and traffic simulation models. He also supervises the activities and projects of temporary help, undergraduate students, and graduate students working at the ATAC.

His special interests include traffic engineering, traffic modeling & simulation, traffic software training programs, and intelligent transportation systems (ITS). His master's thesis provided transportation professionals with information about the potential benefits of implementing ITS technologies in small-medium urban areas. His report helped convince local transportation professionals to install variable message signs that provide traveler information to motorists.

He began at the Upper Great Plains Transportation Institute in 1996 as an undergraduate research assistant and later as a graduate research assistant. He earned both his bachelor and master of science degrees in civil engineering from North Dakota State University. Birst is a professional member of the Intelligent Transportation Society of America (ITS America), Institute of Transportation Engineers (ITE), and American Road and Transportation Builders Association (ARTBA), International Municipal Signal Association (IMSA), as well as a board member of the Fargo-Moorhead Transportation Club.

John Bitzan

An advanced research fellow and adjunct professor in the department of agribusiness and applied economics, Dr. John Bitzan focuses on railroad price and cost analysis, analysis of transportation industry structure, transport regulation and policy analysis, and railroad operations analysis. An economist, his research translates transportation questions regarding railroads, transit performance and cost, commodity movement, and environmental impact.

Dr. Bitzan has worked with the Upper Great Plains Transportation Institute for more than a decade and worked on the first studies the Institute performed on rural transit and rural road financing. His work for the Federal Railroad Administration, the United States Department of Agriculture, and the United States Department of Transportation assists them in making positive economic decisions in transportation development.

The impact of short line railroads to rural and agricultural areas, the structure of railroad costs, and the benefits or costs of mergers and basic railroad costs are all areas in which Dr. Bitzan continues to work. Two of his major research interests are transport industry regulation, and transport industry structure and performance.

Dr. Bitzan earned a bachelor of arts degree in economics at St. Cloud (Minnesota) State University, master of arts in applied economics at Marquette University and a doctoral degree in economics at the University of Wisconsin-Milwaukee. He has published numerous reports and journal articles.

Junwook Chi

Junwook Chi is a research associate with the Institute and a part-time Ph.D. student in the transportation and logistics program. Since joining the UGPTI in March 2002, Chi has primarily been involved in the North Dakota Strategic Freight Analysis Project. He is conducting his research by investigating the past and ongoing research literatures, building bridges over the gap between theory and practice, and communicating effectively with other researchers and industry people.

Junwook earned a bachelor's degree in forestry resources at Konkuk University (South Korea) and a master's degree in agricultural economics and business at the University of Guelph (Canada). He has received an outstanding MSc thesis award from the Canadian Agricultural Economics Society and has published numerous journal papers.

Gene Griffin

Gene Griffin heads the Upper Great Plains Transportation Institute, with an annual budget of more than $3.5 million and a staff of 30. Since 1980, the Institute has expanded from a staff of two and a budget of $175,000 to its present status. During this time the Transportation Institute's research and support staff have worked together as a team to establish itself as a center of excellence with a national reputation in its thematic area of *Small Urban and Rural Transportation and Logistics*. Specializing in this thematic area has allowed the Institute to develop a niche expertise that supports North Dakota and similar areas throughout the nation and the world.

His primary responsibility is providing leadership for the organization and creating the environment for the research and support staff to be successful. He is also ultimately responsible for the nine established programs and two focus areas.

His 28 years of experience in transportation and logistics research and as a research administrator contributes to his scholarly work in economics, management, business logistics and public policy. These interests link to rail and motor transport, low-volume roads, economic development and agricultural transportation. Current research interests include truckload driver retention, county road planning, rural and small urban transit with a particular interest in intelligent transportation applications, agriculture's long-term transportation needs, and logistics applications in small urban and rural areas. Past research delved into railroad economics; agricultural transportation and marketing; motor carrier management, economics, and safety; low volume roads; rural transit; and transportation policy.

Among his publications are 24 technical research reports, 42 staff papers and 27 verified statements. He continues to testify in regulatory proceedings and does transportation consulting on a national and international basis. Recently, he completed a review of marketing U.S. Wheat into Mexico.

Griffin earned his bachelor of science in mathematics and his master of science in economics from North Dakota State University.

Gary Hegland

Gary Hegland, who recently joined the Upper Great Plains Transportation Institute, earned both his bachelor's degree and master's degree at North Dakota State University. He works for the Small Urban and Rural Transit Center (SURTC) focusing on small urban and rural transit systems in the upper Midwest states of western North Dakota, Minnesota, South Dakota, Montana and Wyoming. Hegland worked on the family farm and in sales, both making him aware of rural North Dakota transportation issues. Before coming to SURTC, he was with Job Service North Dakota as a research analyst. An Air Force veteran, he flew B-52 aircraft. Farmer, businessman, veteran – all practical experiences for UGPTI and SURTC.

Jill Hough

Jill Hough has 12 years of experience in transportation research. Ms. Hough currently serves as the director of the Small Urban & Rural Transit Center, which focuses on research, education, and training for the public transportation industry. In addition to working in the area of public transportation, Ms. Hough has published reports and articles in the areas of low-volume roads, logistics, and economic development. She has worked on several projects in cooperation with the U.S. Department of Transportation. She spent four months as interim director for the Federal Transit Administration's Transit Intelligent Vehicle Initiative in Washington, D.C.

She currently is working on a doctorate degree in Transportation Technology and Policy from the University of California - Davis. She received master of science and bachelor of science degrees in agricultural economics from North Dakota State University.

Dennis Jacobson

Dennis Jacobson is the program director for the Department of Transportation Support Center (DOTSC). The purpose of this program is to provide NDDOT with NDSU intellectual capital support to solve complex problems in a broad range of academic disciplines that have application to state transportation management issues. The UGPTI, with the support of DOTSC, serves as a portal or gateway to NDDOT for utilizing the intellectual assets of NDSU on transportation-related research activities.

Jacobson came to UGPTI in November 2001. Prior to that he had served in various capacities as an engineer for the North Dakota Department of Transportation. From 1997 to 2001 he served as the East Region Engineer. In this capacity, he was responsible for all program planning, construction and maintenance for the state highways in the eastern half of North Dakota.

Jacobson received his master's degree in civil engineering from NDSU in May 2001. His thesis investigated the relationship of in-place subgrade strength and the actual thicknesses of pavement placed versus what was planned. He has been accepted as a doctoral candidate and is currently working toward his Ph.D. in civil engineering. Jacobson is a registered professional engineer and a member of the professional engineers society and the Association of State Highway Engineers (ASHE).

Jacobson is also a member of the North Dakota National Guard. He currently holds the rank of Colonel and is in command of an engineer brigade for the 34th Infantry Division in Minnesota. He is also in command of three engineer battallions stationed in North Dakota. Jacobson is a 2001 graduate of the Army War College. His centennial war college class was the first class to be awarded masters degrees in strategic studies.

Brenda Lantz

Brenda Lantz is the program director for the Transportation Safety Systems Center. This program helps to improve the safety of our nation's highways through roadside and investigative systems software development, research, training, and education.

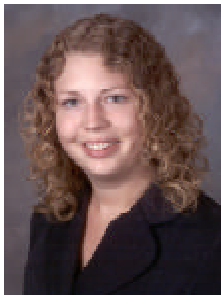
Since 1990, Brenda Lantz has worked in the areas of commercial vehicle safety systems and analysis, business logistics, and intelligent transportation systems for commercial vehicle operations (ITS/CVO) at the Upper Great Plains Transportation Institute.

Lantz has studied commercial vehicle safety from the perspective of commercial vehicle drivers, company managers, and owner-operators, as well as from the perspective of government officials. Her work in designing a national inspection selection system, which guides the selection of commercial vehicles and drivers for roadside inspections based on prior carrier safety data, promotes safer transportation for commercial and non-commercial vehicles.

In addition to managing the development of the various motor carrier software programs and studying ways to improve their effectiveness, her current research involves an evaluation of the effects of ITS/CVO technologies on motor carrier safety and service, with a supply chain perspective.

Lantz has been a statistical consultant to the Federal Motor Carrier Safety Administration (formerly the Office of Motor Carriers). In 1992, she completed one of the first studies that analyzed the relationship of commercial vehicle roadside inspection data to safety review and accident data maintained by the U.S. Department of Transportation.

A current doctoral candidate in business logistics at Pennsylvania State University, Lantz earned a master of science degree in applied statistics in 1994, and a bachelor of science degree in sociology in 1990, both from North Dakota State University.



Kellee Kruse

Kellee Kruse is a research assistant with the Department of Transportation Support Center (DOTSC). She currently manages DOTSC's Information Technology Center, implementing technology related projects and supervising student interns.

DOTSC's student Information Technology Center was started in May 2001. The Information Technology Center integrates NDSU's computer science and management information system students with real world information technology issues and projects. Students are teamed with NDDOT computer analysts to work on various information technology projects and programs. The goal of the program is to familiarize students with government information technology issues and systems. Another goal is to encourage students to stay in North Dakota and work with public or private organizations after graduation.

Kruse's current research projects involve improving roadway maintenance using global positioning systems, geographical information systems, and handheld technology.

Kruse started with the UGPTI as one of DOTSC's first information technology interns in May 2001 and became a full time employee in May 2002 after graduating from NDSU with a bachelor of science degree in management information systems.

Kiel Ova is an associate research fellow working with the Advanced Traffic Analysis Center. He supports the ATAC efforts as project manager and researcher for studies evaluating the application of traffic simulation models for traffic engineering and ITS applications.

Kiel's main focus since employment in December 2000 has been the development of training programs for the VISSIM traffic simulation software. The Upper Great Plains Transportation Institute through NDSU's division of continuing education currently provides a national VISSIM basic course for traffic and transportation engineers. The development of the VISSIM training was a good transition for Ova, since his thesis work used the model to evaluate the transit signal priority strategies for the downtown Fargo area.

Kiel has worked with UGPTI since 1997 as an undergraduate research assistant with the Low-Volume Roads program and as a graduate research assistant with the ATAC program. Kiel utilized the resources at UGPTI to start a local student chapter of the Institute of Transportation Engineers (ITE), which he served as president for two years. He still supports the ITE chapter through the Transportation Student Association, a student organization he helped create during graduate school.

Ova earned a bachelor of science degree and a master of science degree in civil engineering, both from North Dakota State University. Ova is also an associate member of the ITE.

Kiel Ova

Rodriguez is the TEL8 programming director and is responsible for planning and scheduling the programming of the network. She coordinates efforts between the members of TEL8, including state departments of transportation and MPC universities. She works with presenters, site coordinators, and TEL8 board members to improve the offerings, participation, and quality of the TEL8 network. She also facilitates two Franklin Covey workshops offered several times each year.

She is an associate research fellow studying motor carrier economics and safety. She works with commercial trucking companies and federal programs for performance-based management. Job satisfaction is a particular area of interest because her research has shown that truck drivers like to be truck drivers, yet there is a 100 percent turnover rate in the profession. Rodriguez conducts surveys of national significance and provides expertise in the area of motor carrier management and safety. Noting that commercial transportation is a matter of competition and cooperation where the fastest, best, and least expensive will succeed, Rodriguez helps implement performance-based concepts.

Rodriguez began working for the Institute as a student in 1982. She has since earned both her bachelor of science and master of science degrees in agricultural economics from North Dakota State University. She is currently taking coursework towards a Ph.D. in communication from NDSU.

Julie Rodriguez

Dr. Ayman Smadi is director of the Upper Great Plains Transportation Institute's Advanced Traffic Analysis Center. With his leadership, ATAC assists second-tier cities, state Departments of Transportation and others in conducting operational and planning level traffic analysis. ATAC also facilitates the use of advanced traffic modeling tools through technical support, hands-on training and research. The Center supports intelligent transportation systems deployment, including planning, integration, evaluation and funding arrangements for advanced traffic signal control and traveler information systems, incident management systems and integration of advanced systems.

Smadi also is North Dakota State University's program director for the Mountain-Plains Consortium.

Responsible for extensive research, Smadi studies transportation systems and planning, traffic engineering, intelligent transportation systems and computer modeling. Computer modeling supports the development and management of viable research and teaching. He uses a comprehensive, multidisciplinary approach to research, service, education and training. His work helps public transportation agencies as they face funding challenges while the demand for more and better services continues to increase. Smadi conducts and manages significant research grants.

Efficient transportation is essential for both business and consumer, locally and globally. Smadi's expertise in intelligent transportation systems, traffic engineering and safety, transportation network analysis and computer modeling, and transportation planning and freight transportation demand modeling contribute to that efficiency. Efficiency, in turn, contributes to safe and productive use of roadways at the best dollar value.

Smadi, an advanced research fellow, began his work at the Institute as a research associate and adjunct professor in civil engineering in 1993. In 1996 he became the NDSU program director for the MPC and in 1998 became ATAC director. He received a doctorate in civil engineering from Iowa State University, Ames; a master of science degree in civil engineering from the University of Oklahoma, Norman; and a bachelor of science degree in civil engineering from Yarmouk University, Irbid, Jordan.

Ayman Smadi

Denver Tolliver

Dr. Denver Tolliver is program director of the Mountain-Plains Consortium. The MPC is devoted to transportation education, research, technology transfer and service. North Dakota State University is the lead university for MPC and the Upper Great Plains Transportation Institute is the administrator. The other three partners are the University of Wyoming, Colorado State University and the University of Utah. Tolliver, at NDSU for more than two decades, is a senior research fellow and adjunct professor of agricultural economics and civil engineering.

Much of his research addresses freight and intermodal analysis, statewide transportation planning and highway impact, wrapping environmental analysis into the package. Tolliver also looks at highway investment planning and does analysis for the North Dakota Department of Transportation. His work on investment planning for the NDDOT provides valuable information to better understand and facilitate rail service operations.

Through his efforts, MPC is one of 10 competitively selected university transportation centers in 10 federal regions in the United States. MPC represents Region 8, which includes North Dakota, South Dakota, Montana, Wyoming, Colorado and Utah. The program is funded on a 50-50 matching basis by the U.S. Department of Transportation. The grant has been awarded each year since 1988.

His work in graduate transportation programs at NDSU through the TEL8 telecommunication system provides interdisciplinary multi-modal courses for students in the College of Agriculture and Applied Economics, and Civil Engineering and Architecture. Students in other majors also take the courses as technical electives.

Tolliver expands his work beyond highway and rail to include river transportation and how the entities might interact. The Mississippi River is a transportation corridor to which truck and rail in the Dakotas could link. While this is regional in nature, it can be a financially viable option. He monitors the environmental impact of investments and shifts in rail, highway and river traffic. Through research, education, administration and communication with the public, he encourages effective use of time, energy and funding for transportation.

His doctorate in environmental design and planning and his master of science degree in urban and regional planning are from Virginia Polytechnic Institute and State University; and his bachelor of science degree in geography is from Morehead State University.

Kimberly Vachal

Kimberly Vachal is an associate research fellow with the Upper Great Plains Transportation Institute, She works with local, regional, and national agricultural groups to identify logistical opportunities and assess policy implications for non-metropolitan areas. Her work focuses on promoting a healthy, competitive logistical system that will enhance the position of products in domestic and export markets.

She began her career at the Institute in 1992. Her career path has included positions with Cargill, Inc. and the Canadian Pacific Railway. These experiences have been valuable in her research focus areas of agricultural logistics and non-metropolitan economic development.

Kimberly earned both bachelor and master of science degrees in agricultural economics from North Dakota State University. She is currently pursuing a doctoral degree in public policy from George Mason University.

Carl Alyea
(photo not available)

Carl has been a software engineer with the Transportation Safety Systems Center since 1997, and is primarily responsible for the ProVu, UFA, and CDLIS Access software as well as the driver component of Query Central.

Tim Brown
(photo not available)

Tim has been a software engineer with the Transportation Safety Systems Center since 1998, and is primarily responsible for the CaseRite software as well as the reports component of Query Central.

Peggy Kaiser
(photo not available)

Peggy has been a software quality assurance and test engineer with the Transportation Safety Systems Center since 2000, and is responsible for the quality assurance of all the Center's applications.

Gary Talpers
(photo not available)

Gary has been a software engineer with the Transportation Safety Systems Center since 1998, and is primarily responsible for the ASPEN and ISS software as well as the overall development of Query Central.

Dottie West
(photo not available)

Dottie has been a software engineer with the Transportation Safety Systems Center since 1999, and is primarily responsible for the Blizzard and PIQ software as well as the internal queries component of Query Central.

Support Staff

Mitchel Hoffart A telecommunications technician with the Upper Great Plains Transportation Institute for seven years, Mitch Hoffart works with software, hardware, networks and telecommunications to support the research staff.

He also travels North Dakota taking transportation related photographs. Several of his photos have been published in the North Dakota Blue Book.

Hoffart conceived and designed the logo for TEL8, the videoconference network administered at the Institute.

He is working on a bachelor of fine arts degree. He holds an AAS degree in industrial electronics and computer science.

Mary Marquart Mary Marquart is an administrative assistant at the Upper Great Plains Transportation Institute. She assists the directors of the TEL8 and ATAC programs, managing the day-to-day activities with emphasis on financial accounting and reporting.

Marquart attended Bismarck Junior College and has held administrative secretarial positions at colleges in Bismarck, Moorhead, and Fargo.

Kathy McCarthy Kathy McCarthy is the administrative manager of the Institute and the Mountain-Plains Consortium. She maintains all financial accounting records for the two programs and is the office manager.

McCarthy prepares biennial and annual budgets, manages and processes grants and contracts, assists in managing education programs and distance education courses for four consortium universities, and plans and coordinates regional and national meetings. She is also the registrar for students in the MPC distance education program.

With more than 25 years of experience in the secretarial field, McCarthy joined the Institute in 1990.

Patrick Nichols Patrick started his career with UGPTI in 2002 as a Web Communications Manager. With over two years experience in web communications, Patrick hopes to expand his knowledge base by pursuing his masters. Patrick focuses on improving the day-to-day operation of UGPTI's web sites along with developing new ways to communicate with our web users. He holds a bachelors degree in graphic communications.

Susan Peterson With the Upper Great Plains Transportation Institute for three years, Susan Peterson is an administrative secretary and manages the student time slips, orders supplies and pays the bills; and maintains the library. She assists the UGPTI research staff with travel and meeting arrangements

She holds a bachelor of science degree from the University of North Dakota in speech pathology and audiology and a bachelor of science degree in elementary education from Concordia College, Moorhead. She also teaches in the transitions program for the Fargo Public Schools.

Kathy Short Kathy has been a web developer with the Transportation Safety Systems Center since 1999. She is primarily responsible for the FMCSA Information Systems web site, as well as 508 compliance for Internet applications.

Beverly Trittin At North Dakota State University for more than 25 years and with the UGPTI for 10 years, Beverly Trittin is a visual communication specialist. She creates the brochures, newsletters and presentations for the Institute.

Active on campus, Trittin has been a representative to the Staff Senate serving on the public relations; scholarship; and campus space and facilities committees.

She graduated from the North Dakota State College of Science with a general office degree.

Permanent Full-Time Staff

Carl Alyea	Senior Software Engineer	(303)969-5140 x392	carl@ugpti.org
Rob Arthur	Associate Research Fellow	231-7145	robert.arthur@ndsu.nodak.edu
Mark Berwick	Associate Research Fellow	231-9594	mark.berwick@ndsu.nodak.edu
Douglas Benson	Program Director, TEL8	231-8388	doug.benson@ndsu.nodak.edu
Shawn Birst	Traffic Engineer	231-1063	shawn.birst@ndsu.nodak.edu
John Bitzan	Associate Research Fellow	231-8949	john.bitzan@ndsu.nodak.edu
Tim Brown	Senior Software Engineer	(303)969-5140 x399	tim@ugpti.org
Junwook Chi	Associate Research Fellow	231-7616	j.chi@ndsu.nodak.edu
Gene Griffin	Director	231-8343	gene.griffin@ndsu.nodak.edu
Gary Hegland	Associate Research Fellow	231-6436	gary.hegland@ndsu.nodak.edu
Mitch Hoffart	Telecommunications Tech.	231-8074	mitch.hoffart@ndsu.nodak.edu
Jill Hough	Associate Research Fellow	231-8082	jill.hough@ndsu.nodak.edu
Paul Huckins	Computer Hardware/Network Specialist	(303)969-5140x394	paul@ugpti.org
Dennis Jacobson	Program Director, DOTSC	231-7766	dennis.jacobson@ndsu.nodak.edu
Peggy Kaiser	Software Quality Assurance and Test Engineer	(303)969-5140 x420	peggy@ugpti.org
Kellee Kruse	Research Assistant	231-7230	kellee.kruse@ndsu.nodak.edu
Brenda Lantz	Program Director, FSP	(303)969-5140 x329	brenda.lantz@ndsu.nodak.edu
Mary Marquart	Administrative Assistant	231-8058	mary.marquart@ndsu.nodak.edu
Kathy McCarthy	Administrative Assistant	231-7767	kathy.mccarthy@ndsu.nodak.edu
Patrick Nichols	Web Communications Manager	231-7718	patrick.nichols@ndsu.nodak.edu
Kiel Ova	Traffic Engineer	231-1086	kiel.ova@ndsu.nodak.edu
Susan Peterson	Administrative Secretary	231-8793	susan.peterson@ndsu.nodak.edu
Julie Rodriguez	Associate Research Fellow	231-7999	julie.rodriguez@ndsu.nodak.edu
Kathy Short	Web Developer/ Production Artist	(303)969-5140 x355	kathys@ugpti.org
Ayman Smadi	Program Director, ATAC	231-8101	ayman.smadi@ndsu.nodak.edu
Gary Talpers	Software Engineer	(303)969-5140 x421	gary@ugpti.org
Denver Tolliver	Program Director, MPC	231-7190	denver.tolliver@ndsu.nodak.edu
Beverly Trittin	Visual Communication Spec.	231-7137	bev.trittin@ndsu.nodak.edu
Kimberly Vachal	Associate Research Fellow	(701)224-5651	kimberly.vachal@ndsu.nodak.edu
Dottie West	Software Engineer	(303)969-5140 x361	dottie@ugpti.org

Graduate Students

Mohammad Farooq	Graduate Research Assistant	231-1079	mohammad.farooq@ndsu.nodak.edu
Heather Gibb	Graduate Research Assistant	231-6428	heather.gibb@ndsu.nodak.edu
Ahsan Habib	Graduate Research Assistant	231-6447	md.habib@ndsu.nodak.edu
Radha Manohar	Graduate Research Assistant	231-6435	radha.manohar@ndsu.nodak.edu
Matthew Martimo	Graduate Research Assistant	231-1088	matthew@atacenter.org
Thiep Phan	Graduate Research Assistant		thiep.phan@ndsu.nodak.edu
Khaled Shouman	Graduate Research Assistant	231-6447	k.shouman@ndsu.nodak.edu
Meera Singh	Graduate Research Assistant		meera.singh@ndsu.nodak.edu
Mohammad Smadi	Graduate Research Assistant	231-9595	m.smadi@ndsu.nodak.edu
James Walker	Graduate Research Assistant	231-6447	james.walkerjr@ndsu.nodak.edu

Affiliated Staff - UGPTI

Ken Casavant
Lynn Kalnbach
Jim Miller
Wes Wilson

Part-Time Staff - UGPTI

Crystal Bahe
Laurel Benson
Renu Jyoti
Mark Lofgren
Joe Louwagie
Megan McPherson
Jessica Stenger

Part-Time Staff: ATAC

Jason Baker
David Bennett
Ryan Erickson
Jason Gates
Jared Heller
Jeff Johnson
Ross Lagasse
Jerilyn Swenson

Part-Time Staff: DOTSC

Andrew Anderson
Christopher Beggs
Corey Bergman
Nicholas Haan
Mark Houge
Mike Isley
Jeff Jirava
Steve Kessler
Jesse Levasseur
Matt Linneman
Chevy Midas
Brandon Sandberg
Bradley Vette
Mark Vizecky