



UPPER GREAT PLAINS TRANSPORTATION INSTITUTE  
NORTH DAKOTA STATE UNIVERSITY

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# ANNUAL REPORT 2002-03

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Upper Great Plains Transportation Institute  
North Dakota State University  
430 IACC Building • PO Box 5074  
Fargo, North Dakota 58105  
Tel: (701) 231-7767  
Fax: (701) 231-1945  
[www.ugpti.org](http://www.ugpti.org)

# ADVISORY COUNCIL

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Curt Peterson  
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## University President's Message



Dr. Joseph Chapman

As North Dakota State University continues to make long-term commitments to meet the educational and economic development needs of North Dakota's citizens, it is important to recognize the role of transportation to the future economic and social success of our state and nation.

The producers of this area's agricultural and manufacturing products rely heavily on transportation to compete in the global marketplace. Arteries of commerce are essential to North Dakota's economy as our crops and goods move to customers around the world.

At the same time, a flourishing transportation system provides mobility for the residents of our state. Mobility is a great facilitator that allows our people to develop and society to flourish.

The Upper Great Plains Transportation Institute is a major contributor to transportation issues that face North Dakota, the nation and the world. In doing so, the Institute is a vital contributor as NDSU emerges as a leader among our peer land-grant institutions.

## Advisory Council Chair's Message



Dave Sprynczynatyk

Transportation is more than infrastructure: it's the key to North Dakota's success in a global economy. The Upper Great Plains Transportation Institute offers part of that key and our state's best hopes for the future.

The Institute operates on the understanding that our transportation system affects and is affected by many other facets of modern life: agriculture, business, economics, computers, urban and rural planning — even human psychology. Over the years, the Institute has strengthened the friendly working relationship between NDSU, political subdivisions, and the private sector, providing exceptional service to its partners and to the people of North Dakota.

Eight major Institute program areas include traffic analysis, agriculture support, transit support, strategic freight transportation, the Mountain-Plains Consortium, transportation safety, transportation-focused telecommunications, and support for the North Dakota Department of Transportation (NDDOT). These programs focus on research, education, and service, and their effectiveness of is a direct result of the Institute's diverse staff of committed, highly trained professionals.

The Institute has always been a change agent, and this has been a year of tremendous growth in a number of areas. For instance, NDDOT is now included on the Advisory Council, and I am proud to serve as this year's chairman. In addition, strong partnerships produced products such as a statewide intermodal feasibility study that led to welcome legislative action; an expanded Department of Transportation Support Center (DOTSC); and an expanded Advanced Traffic Analysis Center (ATAC) in communities across the state.

I encourage you to learn, through this annual report, what the Upper Great Plains Transportation Institute can do for you as it helps create a bright future for our state.

## Director's Message

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Gene Griffin

### **Knowledge is the key underpinning reason for the establishment and continued existence of the Upper Great Plains Transportation Institute.**

At the heart of every accomplishment is some form of human capital. It takes intellect combined with some physical activity to create knowledge, bring forth innovation, make the products that we consume, etc. This process of production, which has taken place since earliest man, has become ever more complex in a knowledge-based economy. Human capital is quickly specializing into intellectual capital. Simply put, this means that economic agents add more to the production process through the use of their brain than brawn and the other traditional factors of production: land, financial capital, and physical capital.

This seems to be true at all levels and types of work. The country grain elevator manager and workers that make a modern country grain elevator work efficiently is a good example. Jobs involving the use of sophisticated machinery, computers, and information systems for grading, pricing, purchasing and running computerized storage, blending, and shipping systems are good examples of how they have become knowledge workers. The same is true in production agriculture where farmers have to run complex machinery that is often computerized and techniques for raising food and fiber have become evermore complex. People involved on factory floors operating sophisticated automatic and robotized assembly systems offer another example. Almost every other job has become increasingly a knowledge job ranging from office assistants, to highway construction workers, to research scientists.

This is the result of a number of different factors including globalization, continued emergence of market based economies, democratization and freedom, and, most importantly, the rapid expansion of knowledge. As the development of knowledge continues on the exponential part of the total knowledge curve all of society will become increasingly dependent on knowledge, and its application, as a source of viable employment.

What does this have to do with the Transportation Institute? Everything! The basis for the Institute's existence is knowledge. We are involved in several ways, the creation of knowledge, the application of knowledge resulting in innovation, the development of knowledge workers through education, and the enhancement of existing knowledge-based workers through continuing education and technology transfer. This is, indeed, the classical mission of a land grant university such as NDSU which the Institute has become an integral part of. An important reason for the Institute's success is the recognition of this shift to a knowledge-based economic system. It has resulted in significant growth in output of students, research results, applications in rural and urban settings, and assistance to individuals and groups in adopting new ways of doing things that matter to society.

The Institute is involved in another way in the shift to a knowledge-based economy. It relies totally on all of the staff and students as knowledge workers to achieve success. This includes support staff, research and teaching staff, graduate and undergraduate students and administrators. Every individual's intellectual contribution is important in making a positive difference in mobility for the people and businesses of North Dakota, the region, and the country.

There are several other entities that contribute to the Institute's success including NDSU administration, executive and legislative branches of government, and North Dakota Department of Transportation along with several others. With their support and assistance and the continued contribution of the Institute's intellectual capital we will continue to make a positive difference in the personal and business lives of our constituents.

# ADVANCED TRAFFIC ANALYSIS CENTER (ATAC)

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Ayman Smadi

ATAC, a technology support center, addresses transportation needs and issues in small-to-medium size cities. ATAC focuses on enhancing transportation systems through advanced traffic analysis and ITS solutions to address safety and mobility issues. It partners with public agencies and private consultants to analyze and model complex scenarios and evaluate alternative operating strategies and geometric enhancements.

The center provides support to decision makers responsible for planning, operating and funding transportation systems. In addition to the technical assistance provided to its partners, ATAC offers a variety of training and educational opportunities utilizing highly qualified staff and state-of-the-art tools.

## Research Staff:

Ayman Smadi, Director  
Shawn Birst  
Matthew Martimo  
Kate Miner



Shawn Birst

## CURRENT RESEARCH ACTIVITIES

- Intelligent Transportation Systems (ITS)

### Statewide ITS Plan

ATAC is working with the North Dakota Department of Transportation and other stakeholders on developing a strategic plan that would guide ITS deployment in North Dakota. The plan identified three main areas of potential application of ITS in the state including traveler information, traffic operations and maintenance/construction management.

### ITS Regional Architecture

ATAC is assisting statewide regional ITS architecture development and supporting NDDOT and local transportation agencies' efforts to deploy transportation technologies across the state. Project locations included Minot Air Force Base access; I-94 and I-29 in Fargo; Bismarck State Street video detection; and the Main Avenue reconstruction project in Fargo.

### Research Equipment Specifications for ITS Components

DMS (Dynamic Message Signs)  
Video Detection and Surveillance Cameras  
Communications Systems



Matthew Martimo



Kate Miner

## ADVANCED TRAFFIC ANALYSIS CENTER (ATAC)

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- Travel Demand Model Improvement and Support Program

The program was initiated through a partnership between North Dakota MPOs (Bismarck-Mandan, Fargo-Moorhead, and Grand Forks-East Grand Forks) and NDDOT to develop a resource for travel demand modeling and forecasting at ATAC. The program, set up initially for two years, would ultimately benefit planning and forecasting in small-to-medium size urban areas nationwide. A continuation of the program has been approved for three more years. Recent activities include:

Fargo-Moorhead Model Reconstruction

A 1995 travel demand model was updated to incorporate growth areas in the metropolitan area, refine the model structure through enhanced network performance parameters and additional trip types, and implementing the model in the latest software system that takes advantage of GIS capabilities.

Bismarck-Mandan Model Update and Recalibration

ATAC is working with the Bismarck-Mandan MPO to update and calibrate its travel demand model by incorporating land use and transportation network changes.

- Traffic Operations and Technical Assistance Activities

Moorhead Area Train Detection

The center is assisting the Minnesota DOT to conduct an evaluation of the project and measuring its impacts on traffic operations in the area.

VISSIM Hardware-in-the-Loop Simulation - NEMA TS2 Interface

Development of hardware-in-the-loop simulation using the VISSIM traffic simulation software and EAGLE EPAC300 traffic controllers.

Washington Street Corridor Analysis - Grand Forks

This project compared and evaluated different signal optimization and traffic simulation programs and used the results to improve travel along the corridor.

Tyler Parkway and Burnt Boat Drive - Bismarck

The center evaluated the intersection and provided alternative solutions to improve operations.

Funding support: Federal Highway Administration, North Dakota Department of Transportation, North Dakota MPOs.

### TRAINING EFFORTS

- VISSIM

This comprehensive course is designed to provide users with training to effectively use VISSIM. The basic course is intended for individuals with varying levels of experience using VISSIM, from beginner to intermediate. The course material is arranged to guide the user in building VISSIM networks and modeling traffic control features. Participants will also learn how to run the model and interpret results using advanced network features. This course extensively uses case studies and class problems to maximize the learning experience.

## ADVANCED TRAFFIC ANALYSIS CENTER (ATAC)

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### PAST COURSES

February 2003 - Orlando, Florida - 17 participants

February 2003 - Jefferson City, Missouri - 22 MoDOT participants

### FUTURE COURSES

September 2003 - San Francisco, CA

February 2004 - Orlando, FL

### STUDENT INVOLVEMENT/PROJECTS

#### *Graduate Students*

Ahsan Habib - CORSIM software enhancement

Joseph Moses - CORSIM software enhancement

Khaled Shouman - Traffic Detector Design

James Walker - ITS Architecture

#### *Undergraduate Students*

Jason Baker

David Bennett

Peter Cluever

Jared Heller

Dana Johnson

Alan Kemmet

Ross Lagasse

Aaron Lauinger

Christopher Northrup

Andrew Paulsen

Ryan Schumacher

Jerilyn Swenson

Gary Thomas



# AGRICULTURE TRANSPORT CENTER

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Kimberly Vachal

The Agriculture Transport Center focuses on policy and investment decisions that affect the competitiveness of U.S. producers. Activities include research into efficient use of local resources in road investment and maintenance as well as effects of national transport investments and policies on the ag sector. The center is positioned to continue its successful relationship with the USDA Transportation and Marketing Program addressing national issues. The center recently met with the USDA to outline research projects and outreach plans for the next year.



Mark Berwick

The center is actively involved in several research projects including the value of short line railroads to rural America and the differential impacts of rail rate deregulation. The short line study is critical to local road/rail investment decisions in a time of continuing rationalization of the nation's rail system. The rail deregulation study provides insight for those concerned with how rail rates have influenced the competitive position of captive shippers. Many studies have considered the overall effects of rate deregulation for industries or commodities, but this study looks specifically at the regional variation in benefits derived from the competitive rail rate structure. The study will highlight the impact of intermodal and intramodal competition on captive shipper rail rates.

In a new program initiative, the center will cooperate with USDA to periodically gather information about the grain truck market. Information regarding grain truck rates, services, and activity is limited in existing public data sources. The truck market is highly competitive and in constant transition as it responds to market signals. Gaining knowledge about the fundamentals of this market will provide grain producers with a new tool in managing their businesses.



John Bitzan

To accommodate a growing program of research and outreach, the center recently hired Tamara VanWechel, a 2002 graduate of NDSU. She is actively involved in several projects related to local grain procurement and national grain transport flows. Her enthusiasm and experience are a great addition to the research staff.

The center continues to focus on activities that encourage efficient and effective transport policy and investment for agriculture. Although agriculture is a rather mature sector in the U.S. economy, it is critical that U.S. producers identify opportunities and address issues associated with domestic and foreign ag product transport. The center will continue to engage national, regional, and local organizations in research and activities that support the interests of U.S. agricultural producers. This cooperation allows the center, and others, to leverage resources contributing to the competitiveness of U.S. agriculture in a dynamic global marketplace.

## Research Staff:

- Kimberly Vachal, Director
- Mark Berwick
- John Bitzan
- Tamara Van Wechel



Tamara  
VanWechel

## AGRICULTURE TRANSPORT CENTER

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### CURRENT RESEARCH ACTIVITIES

- Containerized Grain and Oilseed Exporters: Industry Survey  
The goal of this project is to develop a profile of the U.S. containerized grain and oilseed export industry, including marketing activities, future expectations, information needs, and business practices.
- Grain Transportation Report Data Collection  
The Grain Transportation Report is a USDA publication that offers timely stories and data important in managing grain transportation. Information regarding barge, rail, truck, and vessel rates, policy issues, and market activities are highlighted in this weekly report.
- ND Grain Industry Data  
The center manages and disseminates the North Dakota Public Service Commission grain transportation information. Data is aggregated in quarterly and annual industry activity reports. Unlike any other state, insight into modal activities, shares, and competition is possible with this unique data source. The information is a valuable resource for management of grain industry investments and policy discussions.

Funding support: U.S. Department of Agriculture, U.S. Department of Transportation, North Dakota Wheat Commission.

# DEPARTMENT OF TRANSPORTATION SUPPORT CENTER (DOTSC)

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Dennis Jacobson

The DOT Support Center is a partnership intended to provide DOT with information and intellectual support from North Dakota State University to help solve complex transportation problems.

Fiscal year 2002-2003 marked the third anniversary of the establishment of the DOT Support Center. The program was continued and enhanced by DOT because of its positive impacts on the department's 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. Completed projects covered the gamut of transportation engineering. 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, Jeff Jirava, completed a study of the standards for temporary median crossovers. Another research project on erosion control measures is still in progress. That study has been undertaken by the first graduate student from the program.



Kurt Johnson

The student engineering center has nine student employees. NDDOT promoted the past intern supervisor, Ron Henke, to a leadership position in the design division in Bismarck. Matt Linneman has assumed leadership duties under the supervision of a design engineer in the design division. An entry level engineer will be hired in FY 03 to fill Matt's old position. Student engineers placed in NDDOT are Matt Gangness, Steve Kessler and Brandon Biese. 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 after graduation.



Kellee Kruse

Another successful program has been the student information technology center. The program supervisor, Kellee Kruse, left the program after a year. She has taken a program management position with the Transportation Security Agency (TSA) in freight security. Kellee was an excellent supervisor and a by-product of our IT intern program. She continues to correspond with UGPTI on freight security issues and will be a long term asset for the institute, the university and the state. Another student intern was hired to fill this vacancy.

Tom Simmer is now the full time supervisor of the IT Intern program. Tom graduated with an undergraduate degree in computer science from NDSU in 2002. He is currently enrolled in the MBA program and expects to finish in the spring of 2004. Tom is a former student worker in the University's IT Department. Nine IT students worked in the center during the spring semester and four full time interns were employed during the summer semester.



Tom Simmer

There are currently 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 and numerous other computer 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.

## DEPARTMENT OF TRANSPORTATION SUPPORT CENTER (DOTSC)

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Another new employee is Kurt Johnson. Kurt comes to the Institute from the American Association of State Highway and Transportation Officials (AASHTO). Kurt served as a staff engineer supporting transportation related software development and various technical research projects. Prior to AASHTO, Kurt served as the vice president for pavements for ERES consultants from Champaign, Illinois. In that capacity, Kurt oversaw the design and implementation of numerous pavement and airfield management systems for clients throughout the United States. Kurt is a former employee of NDDOT and last served as the pavement management engineer. Kurt will be developing the Institute's Pavement Preservation Center. He will be serving in a support capacity for the NDDOT's pavement preservation efforts, as technical staff support for the NDDOT strategic plan and will also be reaching out to other transportation agencies to support their pavement and bridge preservation efforts.

Dennis continues to work on his doctoral degree while managing all of the activities of the center. He will complete his course work requirements in the fall of 2003 and anticipates starting a dissertation proposal shortly thereafter. During the year he completed research projects on roles and responsibilities for transportation management and the economic impacts of transportation. Both reports were in support of NDDOT's 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 NDDOT's Strategic Business Plan. These reports will be used as base reference documents for the department's smoothness enhancement task force. Dennis continues to support the student interns and supervises their research projects. During the past year, student engineers have researched drainable base standards and median crossover standards. Dennis also jointly supervised a senior research project for a group of industrial engineering students. Their topic was improved ride quality inspection specifications and standards. Efforts are continuing to bring transportation graduate students into these research efforts and expand this essential program for students.

### Research Staff:

Dennis Jacobson, Director  
Kurt Johnson  
Kellee Kruse  
Tom Simmer

## CURRENT RESEARCH ACTIVITIES

DOTSC is completing a research project on the cost effectiveness of improved ride quality. In addition, an engineering graduate student is researching and preparing an NDDOT manual on erosion control methods and procedures. Pavement preservation is taking a considerable amount of time with both Dennis and Kurt working to develop a pavement preservation model for small urban and rural areas and eventually NDDOT. A research project on post-highway improvement forensic analysis is proposed for funding as well. Dennis and Kurt are serving as staff support engineers to all NDDOT task forces working on strategic plan objectives. This will require research on load restriction policies and procedures as well as ride quality standards and equipment. In addition, both will work with Denver Tolliver to implement the HERS-ST analysis of both the state's highway network and also the urban areas.

Funding support: N.D. Department of Transportation

## TRAINING EFFORTS

Pavement Preservation Conference - June 17 and 18 (32 participants)

## DEPARTMENT OF TRANSPORTATION SUPPORT CENTER (DOTSC)

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### STUDENT INVOLVEMENT/PROJECTS

#### Graduate Students

Thiep Phan - Re-write the legal and appeal application used by Hearing Officers

Tom Simmer- Sign Inventory project; Ride Analysis project

#### Undergraduate Students

Andrew Anderson

Lucas Asche

Curtis Becker

Brandon Beise

Corey Bergman

Rebecca Christopher

Matthew Gangness

Jeff Jirava

Valerie Jones

Steven Kessler

Adam Koehler

Jennifer Levi

Jesse Levaseur

Joshua Lovseth

Megan McPherson

Josey Milbradt

Thuy Nguyen

Benjamin Preisler

Lisa Rasmussen

Brandon Sandberg

Matthew Scherer

Jack Smith

# MOUNTAIN-PLAINS CONSORTIUM (MPC)

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Denver Tolliver



Ayman Smadi

The Mountain-Plains Consortium (MPC) is a four-university cooperative effort to develop a transportation education, research, technology and service program. North Dakota State University is the lead institution and UGPTI is the administrative and fiscal home for the program. The other members are the University of Wyoming, Colorado State University and the University of Utah.

Fiscal year 2002-2003 was MPC's fourth year of the TEA-21 grant. During 2002-2003, MPC published 24 new peer reviewed reports and offered 80 graduate-level transportation courses at the four universities. Many additional courses in civil engineering, economics, and business were offered by the participating academic departments. In addition to continuing this strong baseline effort, several new initiatives were launched during FY 2002-2003.

In June 2002 the North Dakota Board of Higher Education approved a new Ph.D. degree program in transportation and logistics. This milestone was the culmination of a multi-year process of program development and committee and peer review. In the fall of 2002, the inaugural class of six students enrolled in the program. Six additional students are expected to enroll in the fall of 2003. Seven new or updated doctoral level courses were offered in 2002-2003, including Transportation Systems I , Transportation Systems II, Intermodal Freight Transportation, Quantitative Modeling, Probabilistic and Deterministic Methods, Economics of Transportation Systems, and Logistics and Distribution Management.

Traditionally, each of the four MPC universities has sponsored National Transportation Week activities individually. For the first time, an entire week of coordinated MPC events took place during National Transportation Week of 2003. These activities included a luncheon for NDSU faculty and invited guests from transportation organizations in the Fargo-Moorhead area. In addition, a series of video conferences were offered by the MPC universities. These video conferences were attended by state transportation department professionals from North Dakota, South Dakota, Wyoming, and Utah, and by faculty and staff of the four universities.

Two important additions were made to the MPC transportation faculty in 2002-2003. Rhonda Young joined the faculty of the Department of Civil and Architectural Engineering at the University of Wyoming. Young recently completed her Ph.D. at the University of Washington, where she also earned a graduate certificate in transportation, trade, and logistics. Young's primary research interests are in transportation decision-making, statewide multimodal planning, and freight transportation. In addition to her research, Young teaches five transportation courses at the University of Wyoming – Highway Engineering, Geometric Design, Engineering Decision-Making, Traffic Controls, Traffic Safety, and Transportation Planning.

Darsono Tjokroamidjojo joined the graduate faculty of the Department of Industrial and Manufacturing Engineering at NDSU in the spring of 2002. Tjokroamidjojo earned BS and MS degrees from the University of Wisconsin-Madison and the Ph.D. from the University of Arkansas, all in industrial engineering. His research centers on applications of operations research analysis techniques, including mathematical programming, optimization and simulation modeling. Tjokroamidjojo will be a major contributor to the transportation and logistics doctoral program. He plans to teach graduate courses in advanced operations research and supply chain management and serve as faculty advisor to several doctoral students.

#### Administrative Staff:

Dr. Denver Tolliver, Director

Dr. Ayman Smadi, NDSU Program Director

### CURRENT RESEARCH ACTIVITIES

- **Small Urban University Transit: A Case Study**  
This project is to design and develop an internal campus transit system that serves the close proximity to campus and interfaces with the city-wide system to better meet the needs of the expanding NDSU campus. The study will assess the possibilities of implementing a university transit service that meets user needs and takes advantage of advanced technologies (i.e., ITS). Development of the system would capitalize on university students and faculty resources within the programs of engineering and business. The study will identify users' preferred transit characteristics and technologies and their willingness to use transit services.
- **Trucking Industry Churn and Its Impact on Communities and ITS Adoption**  
This project seeks to evaluate the trucking industry and identify the continuity of companies, quantify the churn factor, and speculate on the impact of this behavior. A correlation of ITS technology adoption and longevity would also be explored.
- **Clean Air Act Amendments and Western Coal Producers**  
The objective of this study is to simulate the change in coal production and coal flows resulting from the Clean Air Act Amendments of 1990 using a model that allows electric utilities to use the least cost method of pollution control.
- **An Assessment of Rural Road Needs in the Mountain-Plains Region**  
This assessment is to analyze any differences in perceptions of rural road needs between rural road providers and rural road users in Region 8 to determine if user needs are being met.
- **County Road Planning Workbook**  
This project will develop a workbook to assist counties in their road planning processes and a corresponding train-the-trainer program for LTAP personnel.
- **A Review of ITS Application Technology in Logistics and Supply Chain Management**  
The specific objective of this study is to develop a methodology that individual companies could use to assess the impacts that an ITS/CVO technology will have on them and their customers uniquely. These impacts will be considered at both the operational and managerial level.
- **Updating the Uniform Rail Costing System Regressions**  
This project is intended to re-estimate the Uniform Rail Costing System (URCS) Phase I regressions, using current data. Currently, data is available through 1998 to estimate the Phase I URCS regressions. In addition, we will explore other potential functional forms for these regressions, and consider using railroad effect variables in estimating the percent variable of cost accounts.
- **Attitudinal Analysis of Bus Rapid Transit Alternative**  
Analysts will develop a travel demand model that will predict mode share based on individuals' preferences within their particular city. The results will help determine if individuals are likely to choose to ride the BRT system.

## MOUNTAIN-PLAINS CONSORTIUM (MPC)

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- **An Evaluation of Region 8 State Departments of Transportation and Metropolitan Planning Organizations' GIS Technology Application**  
This project is intended to develop a region wide GIS resource for transportation planners, practitioners, and researchers. 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. The study will also identify GIS resources available for transportation researchers in the region.
- **Leveraging Technology Investments: Integration of GPS, GIS and Maintenance Management**  
The goal is to develop a methodology with accompanying software programs which enable maintenance managers to use GPS and GIS technology to capture maintenance program needs and produce graphic and tabular reports of planned and executed programs and unfunded maintenance backlogs.
- **Bus Rapid Transit: An Examination of Political Feasibility Using Case Studies**  
The objective of this study is to develop a framework (identify factors, issues, challenges, etc.) that can be used by communities that are considering implementing a BRT system.
- **Trip Generation Rates for Grain Elevators: A Tool for State and Local Highway Planners**  
The overall objective is to provide state and local transportation planners with information regarding truck trips generated from grain elevators of various types and size. The specific objectives of the project are to: (1) Describe the land-use and transportation demand characteristics of grain elevators, (2) collect and synthesize the facility and traffic data necessary to analyze truck trip rates, (3) formulate and test statistical models for predicting truck trip rates to and from grain elevators, (4) estimate trip generation models and evaluate the statistical properties of these models, and (5) use the models to create a set of trip generation tables for various land-use classifications.

Funding support: U.S. Department of Transportation, N.D. Department of Transportation, NDSU



## MOUNTAIN-PLAINS CONSORTIUM (MPC)

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### STUDENT INVOLVEMENT/RESEARCH PROJECTS

#### Graduate Students

Mohammad Farooq  
Mark Lofgren  
Radha Manohar

#### Undergraduate Students

Jessica Stenger

### Masters Program - Transportation Option

#### Graduate Students:

Mariya Burdina  
Chowdhury Haider  
Daniel Vinje

### PhD Program - Transportation and Logistics

#### Graduate Students:

Alan Dybing  
Heather Gibb  
Weijun Huang  
Sang Young Moon  
Napoleon Tiapo  
Junwook Chi

### EDUCATION PROGRAM

#### Ph.D. Courses

Transportation Systems I (TL782)  
Intermodal Freight Transportation (TL784)  
Transportation Systems II (TL783)  
Economics/Transportation Systems (AGECON771)  
Rural Logistics/Distribution Management (AGECON772)

#### Graduate Courses

Transportation Planning (CE780)  
Economics/Transportation Systems (AGECON771)  
Rural Logistics/Distribution Management (AGECON772)

#### Undergraduate Courses

Managerial Economics (BUSN351)

#### Faculty Teaching Courses FY 2002-03

Dr. Denver Tolliver  
Dr. Ayman Smadi  
Dr. John Bitzan

### F-M Transportation Club Scholarship (NDSU)

The Fargo-Moorhead Transportation Club, a local organization that provides a network for individuals in all areas of the transportation field, recently awarded five scholarships at its April 30 meeting. Jason Baker, an undergraduate research assistant at the UGPTI-ATAC, was one of the recipients of a \$500 scholarship. Scholarship applicants were chosen based on their GPA, goals and accomplishments, and community involvement. The applicants were also required to write an essay describing why they would be a worthy recipient of the scholarship, and how they would contribute to the field of transportation. Jason was accompanied by his supervisor, Matthew Martimo, who is a member of the F-M Transportation Club.

### Ph.D. Students Attend/Present Papers at Canadian Transportation Forum Conference

Several NDSU Transportation Ph.D. students attended the 38th Annual Conference of the Canadian Transportation Forum, May 11-14.

The CTRF conference included participation by carriers, shippers, government officials, consultants and academics from Canada and the United States. The theme of this year's conference, "Crossing Borders: Travel, Trade, Security and Communication," provided important information for updating MPC's focus area of International Cross Border Traffic.

Three of the Logistics and Transportation Ph.D. students presented papers. Heather Gibb presented a paper on "New Technology Adoption and the Implementation of E-Commerce in the Mid-Continent International Trade Corridor Region;" Weijun Huang presented "Strategies Used by Agribusiness, Industries in the Adoption of Shuttle Train Services;" and Alan Dybing presented "Estimation of the Demand for Grain Transportation in North Dakota." Alan's paper was mentioned as a runner-up in conference paper prize presentations.

James Nolan of the University of Saskatchewan commented on the student's professionalism and quality of their presentations – *"All in all, I think it was a very good use of time for the students, giving professional presentations to a receptive and constructive audience. I certainly hope we can make this a regular event."*



### Region 8 Student of the Year

Engineer in Training is the precise definition of Matthew Martimo's education and work as associate research fellow with the Advanced Traffic Analysis Center (ATAC). His enthusiasm and experience are also why Martimo is the 2002 Region 8 Student of the Year. He was among 32 awardees during the Transportation Research Board 82<sup>nd</sup> Annual Meeting in Washington, D.C.

The Mountain-Plains Consortium nomination came from Martimo's research on trip generation rates. His question – "Where does the traffic go?" – led to specific analysis of school and university trip generation rates. Martimo collected primary data through traffic counts at schools, and short interviews with students and parents. His methodology will allow small and medium sized cities to better account for these trips without needing to process traditional survey data.

His work ties into the ATAC Travel Demand Modeling Support Program implemented by Martimo and Ayman Smadi, director of ATAC. Their goal is to develop a resource for transportation planning modeling suited for small to medium size urban areas.

He likes working in a field that is growing, likes the intellectual stimulation, and doing the investigations that will provide practical benefits to people and transportation.

Martimo also likes the big puzzle of high-end analysis. Combining GIS, traffic analysis programs, simulation models and travel demand modeling software together to create practical solutions to problems, he leads the development of software enhancements to traffic simulation models. He recently accepted the responsibility of being the lead member of the ATAC team for teaching Synchro and VISSIM training courses.

His work has allowed him to become uniquely familiar with traffic operations and transportation planning. Integrating and linking engineering and long-range planning are challenges he embraces.

The Mountain-Plains Consortium supported Martimo's nomination as the University Transportation Center Program award winner. He was among Region 8 candidates from Colorado State University, North Dakota State University, University of Wyoming and Utah State University. This was the 12<sup>th</sup> Annual Outstanding Student of the Year Awards ceremony. For the past 11 years, the Department of Transportation has honored the most outstanding student from each UTC.

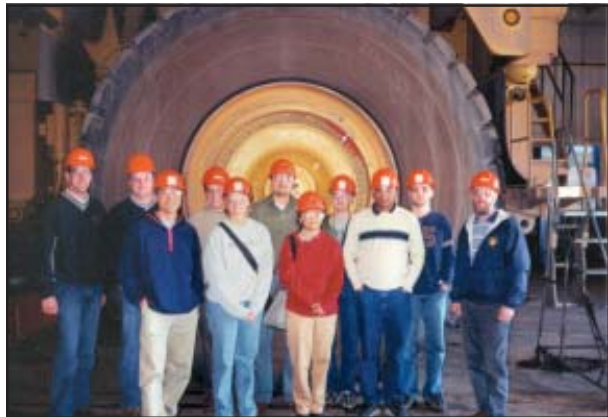
Martimo plans to continue at North Dakota State University, earning his master of science in civil engineering this summer. He holds a bachelor of science degree in civil engineering from NDSU and is registered as an Engineer in Training having passed his Fundamentals in Engineering exam. Continuing at ATAC will allow him to earn his license as a professional engineer. He was president of the ITE student chapter and is a member of Golden Key National Honor Society. Martimo is active in local and regional transportation organizations.

## MOUNTAIN-PLAINS CONSORTIUM (MPC)

### Logistics Students Tour Port of Duluth

On May 16 a group of UGPTI transportation students traveled to northeast Minnesota for tours of the Minntac Iron Ore Facility and the Port of Duluth.

The group of 10 students from John Bitzan's graduate logistics class started the day with a trip to Mountain Iron, Minnesota, to tour Minntac (part of U.S. Steel). Minntac's iron ore mine and processing facilities cover 37,000 acres of land, including a mine that stretches for 10 miles along the Mesabi Iron Range. At this facility, students witnessed workers drilling holes that later would be blasted with explosives to expose large chunks of taconite for further processing. The students also saw 240-ton trucks being loaded with taconite chunks and delivered to the processing plant. In a tour of the plant, the students watched the large taconite chunks (containing 15 to 30 percent iron) being crushed into fine pieces of rock, the iron being separated from other rock with magnets, mixture of the iron with limestone and bentonite, and heating of taconite pellets to 2,400 degrees Fahrenheit. Finally, the students saw where rail cars are loaded with the finished taconite pellets for steel production to be used in appliances and automobiles.



After touring Minntac, the group went to the Port of Duluth for a presentation about the port by Ron Johnson, the port's trade development director. The students learned about the diverse array of commodities handled by the port, including iron ore, coal, grain, and lumber, and about the intra Great Lakes traffic originating in Duluth, as well as the St. Lawrence Seaway System and the importance of the Great Lakes for U.S. international trade. Unfortunately, the students were not able to tour the harbor because of another event.

The trip was an excellent learning experience for Bitzan and the students. The entire group witnessed some real-world applications of transportation and logistics. It also provided a way to integrate classroom knowledge with hands-on learning, solidifying and expanding the knowledge base of the group.

Funding for the trip was provided by the Mountain-Plains Consortium, U.S. Department of Transportation University Transportation Centers Program.

# SMALL URBAN AND RURAL TRANSIT CENTER (SURTC)

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Jill Hough

The Small Urban & Rural Transit Center (SURTC) was established in May 2002 with federal funding. SURTC conducts research, designs educational programs, and coordinates training needs for transit systems in the small urban and rural areas. SURTC's geographic scope presently is North Dakota, South Dakota, Montana, Wyoming, and western Minnesota.

The staff working with SURTC includes Jill Hough, Director of the Center; Gary Hegland and Del Peterson are Associate Research Fellows; Jim Miller is a Faculty Affiliate from Penn State who is working from a distance with the Center; Crystal Bahe is an undergraduate student research assistant majoring in Sociology; and Dustin Ulmer is a student intern who is majoring in Management Information Systems at NDSU.



Gary Hegland

SURTC has a steering committee that provides guidance. The steering committee is comprised of individuals from the DOT's and transit agencies from the five focus states 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 first steering committee meeting was held October 2, 2002. A copy of the meeting minutes are available at [www.surtc.org](http://www.surtc.org)

SURTC staff have participated and presented at several state and national conferences. Jill Hough was selected to serve on the oversight and project selection committee of the Transit Cooperative Research Program. TCRP, authorized in 1991, is a research program designed to focus on needs of transit operating agencies. It is sponsored by the Federal Transit Administration and carried out under an agreement among the National Academies of Science acting through the Transportation Research Board, the Transit Development Corporation, the educational and research arm of the American Public Transit Association, and the FTA. As a member of the TCRP Oversight and Project Selection (TOPS) Committee, Hough will be involved in setting the research agenda for TCRP.



Del Peterson

SURTC publishes The Transit Lane newsletter twice yearly. The newsletters are also available on the website.

#### Research Staff:

Jill Hough, Director  
Gary Hegland  
Del Peterson  
Jim Miller, affiliated faculty

#### CURRENT RESEARCH ACTIVITIES

Underway or completed:

- Needs Assessment was conducted to identify particular research, education and training needs of the transit managers in the five-state SURTC area. The results provided initial input into the projects that SURTC could pursue.



Jim Miller

## SMALL URBAN AND RURAL TRANSIT CENTER (SURTC)

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- Small Urban University Transit: A Case Study  
The objective of this study is to design and develop an internal campus transit system that serves the close proximity to campus and interfaces with the city wide system to better meet the needs of the expanding NDSU campus.
- Transportation of the Disadvantaged  
The objective of this study is to identify the transit needs and services for the disadvantaged and evaluate the level at which these needs are currently being met.
- James River Transit  
The objective of this study is to evaluate the operational feasibility of modifying the James River Transit demand response system to include a fixed route element and measure the gains in services to residents as well as cost savings to the transit system and riders.
- Coordination of North Dakota Transit Services  
The primary objective of this study is to identify how FTA-funded transit systems and other agencies providing transportation can better coordinate services to the residents of North Dakota to better utilize scarce resources.
- Statewide Mobility Plan  
The purpose of the mobility plan is to provide North Dakota policy makers with a guide to future development of public transportation options, and to identify gaps that either now exist in mobility services or are likely to exist in the near future as the result of service curtailments.
- Development of Modified Fixed-Route  
The objective of this study is to evaluate the operational feasibility of modifying the James River Transit demand response system to include a fixed route element and measure the gains in services to residents as well as cost savings to the transit system and riders.
- Coordination of North Dakota Transit Services  
The primary objective of this study is to identify how FTA-funded transit systems and other agencies providing transportation can better coordinate services to the residents of North Dakota to better utilize scarce resources.

Funding support: Federal Transit Administration, U.S. Department of Transportation, N.D. Department of Transportation

### TRAINING EFFORTS

SURTC is working closely with CTAA to evaluate the contents of their Certified Community Transit Manager (CCTM) Manual. The information will be made available on CD-ROM for transit managers to study prior to taking the test to become a CCTM.

Additional training will be offered to transit managers in the five-state region. SURTC will facilitate the training by hosting qualified trainers at their site and communicating the training over the TEL8 system to reach the five-state region.

## SMALL URBAN AND RURAL TRANSIT CENTER (SURTC)

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### STUDENT INVOLVEMENT/PROJECTS

Students have been involved with SURTC. Crystal Bahe, an undergraduate student majoring in sociology, has worked with UGPTI since January 2001. She has assisted with data entry, chart development, and report preparation. She began working with SURTC in May 2002.

Dustin Ulmer, an undergraduate student in MIS, is a student intern with SURTC for the summer of 2003. Dustin is creating databases and simplifying ways to retrieve and use the data.

SURTC has also worked with the NDSU student government. Representative Matthew Murray assisted with the campus transit study initiated by SURTC.

#### Undergraduate Students

Crystal Bahe

Dustin Ulmer

# STRATEGIC FREIGHT TRANSPORTATION

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Mark Berwick

This program addresses key issues in North Dakota and offers information that may help in solving problems, enhancing the state's competitive position through efficient transportation. The purpose of the program is to improve North Dakota's economy by fostering a better understanding of the role that transportation and logistics play in the success of North Dakota's industries, focusing on a specific economic sector each biennium. It also addresses developing human capital for North Dakota firms by training current and potential employees in the fields of transportation and logistics. The program achieves these goals by conducting applied economic and business analysis to specific industrial sectors, disseminating the results of analyses, providing training for management and other employees of the sectors, and developing students to work in these sectors. The overall goal of the program is to improve the competitiveness of firms in North Dakota.



John Bitzan

The program's demands and success created a need for another researcher. Mark Lofgren worked on the last project as a graduate student. He was hired as a temporary full time employee June 1, 2003. Mark completed his MBA in May 2003. Mark's education and experience will be a great asset to the team.

## Research Staff:

Mark Berwick, Co-Director  
John Bitzan, Co-Director  
Junwook Chi  
Gene Griffin  
Mark Lofgren  
Denver Tolliver



Junwook Chi

## CURRENT RESEARCH ACTIVITIES

- North Dakota Strategic Freight Transportation Analysis Project - Manufacturing  
The 2001-2003 biennial study examined the North Dakota manufacturing sector. The study looked at the transportation needs for manufacturing and specialty agricultural producers within the state and mainly focused on container highway/rail intermodal transportation. A steering committee was organized to help direct the research project. With the help of the committee, along with research findings, one of the most significant findings was the need to establish legislation allowing establishment of a port authority within North Dakota. This coincided with the North Dakota bi-annual legislative session. Two bills were established and brought through the legislative process. Both bills passed and were signed by the governor. These bills will allow local entities to establish a port authority, which will allow a community to use taxing and bonding authority to subsidize the port. Establishing a port may provide many economic opportunities that would not exist otherwise.
- North Dakota Strategic Freight Transportation Analysis Project - Motor Carriers  
The 2003-2005 program will focus on the economics of the motor carrier industry and its customers. Specifically, the analysis will focus on costs resulting from obstacles the industry faces in day-to-day business operations. These obstacles include different regulations on size and weight in different jurisdictions, different permitting regulations, and problems faced in retaining and supporting employees in the industry.



Gene Griffin





Mark Lofgren

The motor carrier industry is the only link to the outside world for many North Dakota businesses. This biennial project will focus on the significance of motor carriers and problems motor carriers and shippers face dealing with differences in regulations within North Dakota and the surrounding region. Particularly, the program will focus on regulations of size and weight of commercial trucks. This analysis will evaluate the direct and indirect economic impacts on shippers faced with differences in motor carrier regulations and seasonal load restrictions. The restriction differences between counties, states, and provinces provide a less than optimum transportation system, resulting in higher product costs, lost trade, and reduced revenues for producers and shippers.

Funding support: N.D. Department of Transportation, North Dakota State University



Denver Tolliver

### **TRAINING EFFORTS**

The research team presented findings providing valuable insight for the managers to the advisory committee. The research findings resulted in port authority legislation that may be used by local communities and or counties establishing ports resulting in savings on shipping products intermodally.

This fall the program team will participate in a conference at Minot State University presenting the findings from the last biennial analysis. This presentation will disseminate the importance of supply chain management, port authority, and intermodal transportation to North Dakota businesses.

### **STUDENT INVOLVEMENT/PROJECTS**

Graduate Students

Mark Lofgren - Strategic Freight Analysis for 2001-2003

Undergraduate Students

Jessie Stenger

# TRANSPORTATION SAFETY SYSTEMS CENTER

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Brenda Lantz

Since 1996, UGPTI has operated a specialized software development center in Lakewood, Colorado, to develop and maintain mission-critical front-end software for state and federal motor carrier safety specialists nationwide. This center has evolved into the current Transportation Safety Systems Center (TSSC). The ultimate goal – to improve the safety of transportation operations in the U.S. through leading edge research, development, education, and training – remains the same. The program accomplishes this goal through software development for state and federal safety enforcement specialists nationwide and safety-related research and analysis, as well as presentations and training throughout the year.

The program currently has nine full-time research staff, including the program director, a technical director, four software engineers, a quality assurance and software test person, a computer network and hardware person, and an administrative assistant and web site developer. Charles Edmundson joined the TSSC staff as Technical Director in December 2002, and Andrew Kazmaier joined the TSSC staff as Mission Support Specialist in June 2003.



Carl Alyea

## Research Staff:

Brenda Lantz, Director  
Carl Alyea  
Timothy Brown  
Charles Edmundson  
Peggy Kaiser-Mahardy  
Andrew Kazmaier  
Gary Talpers  
Dorothy West



Tim Brown

## CURRENT RESEARCH ACTIVITIES

- Software Development

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

- The roadside systems include:

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

The Inspection Selection System provides an inspection recommendation as well as a carrier snapshot; The Past Inspection Query has the capability to retrieve previous recent inspection reports for a particular vehicle or driver;

The Commercial Driver License Information System Access software can retrieve a driver's status report and conviction history.



Charles Edmundson

## TRANSPORTATION SAFETY SYSTEMS CENTER

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Peggy  
Kaiser-Mahardy



Andrew Kazmaier



Gary Talpers



Dottie West

- The investigative systems include:

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 documentation, compilation, and creation of the install program);

The CaseRite software helps create legal enforcement cases for federal prosecution of regulation violations;

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

The ProVu software allows Federal, State, and private industry users to electronically analyze standard motor carrier profile reports.

In addition to maintaining and enhancing these software programs, the TSSC is also responsible for two web-based projects. The first project, the Information Systems web site, is primarily used to distribute both information and software. The second project, Query Central, uses the latest web-based technology to consolidate inspector queries on drivers, vehicles, and carriers into a single "intelligent" request. Query Central internally obtains data from several sources, analyzes it, and builds a prioritized report which identifies any past safety or operational problems.

- Safety Research and Analysis

The TSSC program also conducts safety-related research and analysis. The research is directed toward potential improvements to prioritization algorithms used to better target enforcement efforts, as well as toward enhancements to the various software programs. For example, the Inspection Selection System (ISS) algorithm was developed through the TSSC program. The ISS is a decision-aid for commercial vehicle roadside driver/vehicle safety inspections which helps safety inspectors select vehicles for inspection. The inspection value is based on data analysis of the motor carrier's safety performance record using the myriad of information in the National Motor Carrier Management Information System (MCMIS). The ISS has been in use since 1995 and has proven to be very effective in identifying drivers and vehicles of carriers that are most likely to be placed out-of-service for safety problems.

A second recent research project explored 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. Specifically, this study concluded that linking driver conviction data from the CDLIS to the employing motor carrier identifies carriers with higher out-of-service and accident rates.

## TRANSPORTATION SAFETY SYSTEMS CENTER

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A third research project, recently started, proposes two specific objectives. The first objective is to further analyze the driver safety history measure created through the conviction data study. This analysis will involve a more detailed examination of specific convictions that determine the measure, as well as an examination of any past driver-specific accident information that could be included as part of the measure. Utilizing the results of this first objective, the second objective is to implement the driver safety history measure as part of the current Inspection Selection System algorithm and software.

Funding support: Federal Highway Administration, N.D. Highway Patrol

### **TRAINING EFFORTS**

Throughout the year, the staff is involved with numerous presentations and training sessions to educate users and other interested parties about the software developed and the research conducted.

These presentations and training occur at meetings such as the Transportation Research Board, the Commercial Vehicle Safety Alliance, the International Large Truck and Bus Safety Research and Policy Symposium, as well as the Federal Motor Carrier Safety Administration Information Technology Workshop.

# TEL8

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Doug Benson

TEL8 is a Federal Highway Administration (FHWA) telecommunications system dedicated to transportation. Participating sites include state departments of transportation in North Dakota, South Dakota, Montana, Wyoming and Utah, and the four Mountain-Plains Consortium universities, Colorado State University, North Dakota State University, University of Utah and University of Wyoming.

Programming activities continued to expand the past year. TEL8 and the National Highway Institute combined resources to initiate a new series of TEL8/NHI video conference training seminars. TEL8 also conducted preliminary discussions with other training centers considering video conference delivery and continued development of existing programming.

TEL8 initiated a network technology review to evaluate current network and video conference technology. The review resulted in the initiation of a committee to assess a potential RFP for enhancing or upgrading network technology.

The MPC universities hosted four seminars during, and in recognition of, National Transportation Week. This innovative combination of research dissemination and industry recognition included four video conference events over the TEL8 network.

A renewed partnership with the NHI was forged this past year. TEL8 offered its first NHI course in several years as a result and anticipates additional cooperative efforts with NHI in developing video conference standards for both courses and instructors.

Three TEL8 states performed extensive benefit-cost analysis of their participation in TEL8. The three states evaluated the programming, training and research opportunities afforded by TEL8 within the cost structure of the network. All three states decided to continue their TEL8 participation.

TEL8 achieved several significant milestones this past year. TEL8 requested, and the Federal Highway Administration approved, an extension of the pooled fund study. The pooled fund study provides the governing authority for the DOT TEL8 members' financial commitments to TEL8.

TEL8 continued to provide support for WASHTO-X, a pilot project modeled on TEL8. WASHTO-X includes much of the western United States and provides monthly video conference programming. TEL8, again, was a major resource for this program.

TEL8 began a preliminary assessment of a more formal relationship with the WASHTO-X states. The TEL8 board directed the expansion of possible TEL8/WASHTO-X organizational structures including the potential of TEL8 assuming WASHTO-X responsibilities when the pilot project is completed next year. The TEL8 board also formally endorsed WASHTO-X recognizing its successful operations of the past year.

South Dakota added 13 district sites this past year, becoming the third TEL8 DOT to expand to its district-level offices.

Three TEL8 board meetings were held this past year. The board met in Fargo for its annual face-to-face meeting and held two meetings over the system. Issues discussed at meetings included programming evaluations, network technology, NHI initiatives, and all budgetary items.



Julie Rodriguez



Mitchel Hoffart



Mary Marquart

Two new TEL8 board members were appointed this past year. Ron Horner of the North Dakota Department of Transportation and Brian Moore of the South Dakota DOT joined the board.

Several new programming committee members were appointed. Judy Froseth replaced Ken Heitkamp, NDDOT; Brian Moore replaced Dave Huft, SDDOT; Susan Anderson replaced Marjorie Blewett, MDT; and Becky Collins replaced Kelvin Green, UDOT.

#### Administrative Staff:

Doug Benson, Director  
Julie Rodriguez  
Mitchel Hoffart  
Mary Marquart

### **CURRENT RESEARCH ACTIVITIES**

TEL8 initiated several research activities the past year. A technical training study highlighted TEL8's need for expanding technical training. The TEL8/NHI collaborative video conference delivery of DOT training is a result of that study as well as a pilot research activity evaluating new distance learning paradigms. Moreover, a study of the network's technology was begun as part of an assessment of the cost structure and current capacity of the network.

### **TRAINING EFFORTS**

Training offered over the TEL8 system covered subjects as varied as time management, computer-aided drafting, website compliance, state finances, ground penetrating radar, and other topics of interest.

This year the following events were held:

- Leadership Development Institute Workshops (8)
- MPC Short Courses (1)
- NHI Courses (1)
- Seven Habits Workshops (4)
- InfoX Sessions (11)
- TransEx Sessions (16)
- MPC-X Sessions (2)

The major accomplishment this year was the offering of the first NHI course over the system in four years. This partnership is expected to grow in the future.

### **STUDENT INVOLVEMENT/PROJECTS**

There was one graduate class offered over TEL8 this year. Students are always welcome to attend any TEL8 event.

## OTHER RESEARCH

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- An Evaluation of the Pricing Behaviors of Airlines Operating in Small and Medium Sized Communities  
The purpose of this study is to evaluate the pricing behavior of airlines operating in small and medium sized communities. The hypothesis is that some airlines may dominate these smaller markets, potentially working to the economic and social disadvantage of these cities. The study will look at airline pricing behavior to make an assessment of the reasons for differences in fares across markets, with a focus on small and medium sized communities.
- Implementation of a Regional and Short Line Railroad Information System - Year 4  
The objective of this project is to develop an annual information database on regional and short line railroads in the United States to support the policy and research objectives of the sponsoring parties.
- Examination and Assessment of Alternative Approaches in Developing Cost Estimates for Individual Railroad Freight Movements  
This project will provide support for research and assess the feasibility of estimating rail movement costs using new econometric methods and updated data in an effort to achieve better and more timely cost estimates.
- Transportation Quality Indices for Economic Analysis of Non-Metropolitan Cities  
This project's objective is to create indexes that indicate the quality of transportation for cities located in non-metropolitan areas. Two transportation indices will be developed, a freight transportation index and a business traveler mobility index, and will provide a measure of transportation quality, based on composition of and competition within the transport sector.

Funding support: U.S. Department of Transportation, U.S. Department of Agriculture, American Association of Short Line Railroads, Federal Railroad Administration.

## 2002 PUBLICATIONS

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### Staff Papers

- SP-149 TEL8: The Development of a Transportation Video Conference Network
- SP-148 Future Scope and Structure of the Upper Great Plains Transportation Institute: An External Examination
- SP-147 Hearing on Rail Freight Transportation in North Dakota

### Department Publications

- DP-150 North Dakota Strategic Freight Analysis: The Role of Intermodal Container Transportation in North Dakota
- DP-149 North Dakota Strategic Freight Analysis: The Role of Intermodal Container Transportation in North Dakota – Executive Summary
- DP-148 Annual North Dakota Elevator Marketing Report, 2001-02
- DP-147 North Dakota Grain and Oilseed Transportation Statistics, 2001-02
- DP-146 Wages in Rail Markets: Deregulation, Mergers, and Changing Network Characteristics
- DP-145 Small Railroads - Investment Needs, Financial Options, and Public Benefits
- DP-144 Analysis of Revenues and Costs for Wheat Shipments Originated in North Dakota on the BNSF Railroad

### Mountain-Plains Consortium Publications

- MPC 03-149 Asset Management of Roadway Signs through Advanced Technology
- MPC 03-148 Pier Moment-Rotation of Compact and Non-Compact HPS70W I-Girders
- MPC 03-147 Field Investigation of a Strengthened Timber Trestle Railroad Bridge
- MPC 03-146 Evaluating the Impact of QC/QA Programs on Asphalt Mixture Variability
- MPC 03-145 Industry Costs and Consolidation: Efficiency Gains and Mergers in the Railroad Industry
- MPC 03-144 The Differential Effects of Rail Rate Deregulation: U.S. Corn, Wheat and Soybean Markets
- MPC 03-143 Simplified Impact Testing of Traffic Barrier Systems - Phase 1, 2002-03
- MPC 03-142 Real Time Measures of Effectiveness
- MPC 03-141 Adaptive Signal Control II
- MPC 03-140 An Assessment of Regional Road User Needs in Three Rural States
- MPC 02-139 Full-Scale Laboratory Testing of a Timber Trestle Railroad Bridge Chord (Phase 1)
- MPC 02-138 Evaluating Moisture Susceptibility of Asphalt Mixes
- MPC 02-137 Strategies for Addressing North Dakota Department of Transportation Employee Retention and Motivation
- MPC 02-136 Assessment of Temperature Fluctuations in Asphalt Pavements Due to Thermal Environmental Conditions Using a Two-Dimensional Transient Finite Difference Approach
- MPC 02-135 Predicting and Classifying Voluntary Turnover Decisions for Truckload Drivers
- MPC 02-134 Survey of the Education and Human Capital Needs of the Transportation Construction Industry
- MPC 02-133 Determining Surface Street LOS Using Existing Detector Infrastructure: Monitoring Commuter Congestion on Surface Streets in the Salt Lake Valley
- MPC 02-132 U.S. Containerized Grain and Oilseed Exports - Industry Profile: Phase I
- MPC 02-131 Intelligent Transportation Systems: Helping Public Transit Support Welfare to Work Initiatives
- MPC 02-130 Utilizing the Long-Term Pavement Performance Database in Evaluating the Effectiveness of Pavement Smoothness
- MPC 02-129 Safety Analysis without the Legal Paralysis: The Road Safety Audit



# ANNUAL AWARDS BANQUET

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## John Agrey Award



Senator Byron Dorgan received the John Agrey Award at the 7th annual Upper Great Plains Transportation Institute banquet. Dorgan was lauded by North Dakota State University President Joe Chapman as a tireless champion in bringing fairness to North Dakota.

## Paul E.R. Abrahamson Transportation Scholarships



Scott Huso, Agribusiness and Applied Economics  
Hometown: Aneta, ND



Jeffrey Olson, Agribusiness and Applied Economics  
Hometown: Colfax, ND

## Transportation Engineering Scholarships



Matthew Boncquet, Civil Engineering  
Hometown: Hutchinson, MN

(Photo not available)

Ryan Ackerman, Civil Engineering  
Hometown: Minot, ND

Funding for the scholarships is provided by the Mountain-Plains Consortium through a grant from the United States Department of Transportation University Transportation Centers Program. The scholarships were presented at the UGPTI Annual Awards Banquet October 31, 2002.

## Research Staff

Gene Griffin, Director  
 Denver Tolliver, Associate Director  
 Carl Alyea  
 Doug Benson  
 Mark Berwick  
 Shawn Birst  
 John Bitzan  
 Timothy Brown  
 Junwook Chi  
 Charles Edmundson  
 Gary Hegland  
 Jill Hough  
 Dennis Jacobson  
 Kurt Johnson  
 Peggy Kaiser-Mahardy  
 Andrew Kazmaier  
 Kellee Kruse  
 Brenda Lantz  
 Mark Lofgren  
 Matthew Martimo  
 Kate Miner  
 Del Peterson  
 Julene Rodriguez  
 Tom Simmer  
 Ayman Smadi  
 Gary Talpers  
 Kimberly Vachal  
 Tamara Van Wechel  
 Dottie West

## Support Staff

Mitchel Hoffart  
 Mary Marquart  
 Kathy McCarthy  
 Patrick Nichols  
 Susan Peterson  
 Kathy Short  
 Beverly Trittin

## Advanced Traffic Analysis Center

Jason Baker  
 David Bennett  
 Peter Cluever  
 Jared Heller  
 Dana Johnson  
 Alan Kemmet  
 Ross Lagasse  
 Aaron Lauinger  
 Drew Paulsen  
 Ryan Schumacher  
 Jerilyn Swenson  
 Gary Thomas

## ND DOT Support Center

Andrew Anderson  
 Lucas Asche  
 Curtis Becker  
 Brandon Beise  
 Corey Bergman  
 Rebecca Christopher  
 Matthew Gangness  
 Jeff Jirava  
 Valerie Jones  
 Steven Kessler  
 Adam Koehler  
 Jennifer Levi  
 Jesse Levaseur  
 Megan McPherson  
 Josey Milbradt  
 Ben Preisler  
 Brandon Sandberg  
 Matthew Scherer  
 Tom Simmer  
 Jack Smith  
 Mark Vizecky  
 John Wolf  
 Tyler Wollmuth  
 Nicholas Zechmann

## Upper Great Plains Transportation Institute

Crystal Bahe  
 Renu Jyoti  
 Jessica Stenger  
 Dustin Ulmer

## Graduate Students

ATAC  
 Ahsan Habib  
 Joseph Moses  
 Khaled Shouman  
 Mohammad Smadi  
 James Walker  
 DOTSC  
 Thuy Nguyen  
 Thiep Phan  
 UGPTI  
 Mariya Burdina  
 Chowdhury Omar Haider  
 Mark Lofgren  
 Radha Manohar  
 Daniel Vinje

## Ph.D. Students

Junwook Chi  
 Alan Dybing  
 Heather Gibb  
 Weijun Huang  
 Sang Young Moon  
 Napoleon Tiapo

