NORTH DAKOTA STATE UNIVERSITY

HOUSE APPROPRIATIONS COMMITTEE, EDUCATION & ENVIRONMENT DIVISION
Rep. Bob Skarphol, Chairman

SB 2020

Wednesday, March 4, 2009

GENE GRIFFIN, DIRECTOR
Upper Great Plains Transportation Institute, NDSU

Upper Great Plains Transportation Institute
North Dakota State University

The Upper Great Plains Transportation Institute educates people, conducts research, and provides outreach in small urban and rural transportation and logistics to enhance the mobility of people, goods, and agricultural commodities. It accomplishes this mission by:

- Developing and applying knowledge, information and innovation in the public and private sector to improve competitiveness, efficiency, safety, and personal mobility.

- Educating, training and mentoring transportation practitioners and leaders in a rapidly advancing and increasingly complex field with sophisticated technology applications.

- Excelling as one of the premier university transportation centers in the U.S. so that it can continue to attract talent and funding to enhance North Dakota's economy and quality of life.

PROGRAM AREAS

Research and Outreach Programs

- Advanced Traffic Analysis Center (ATAC)
- Agricultural and Industrial Freight Center
- Biennial Strategic Freight Analysis Center
- Department of Transportation Support Center (DOTSC)
- Mountain-Plains Consortium (MPC)
- North Dakota Local Technical Assistance Program (NDLTAP)
- Rural Transportation Safety and Security Center (RTSSC)
- Small Urban & Rural Transit Center (SURTC)
- Transportation Learning Network (TLN)
- Transportation Safety Systems Center (TSSC)

Academic Programs

- Ph.D. in Transportation and Logistics
- Master of Managerial Logistics
- Transportation Option, masters in Civil Engineering and Agribusiness and Applied Economics

Upper Great Plains Transportation Institute at a Glance

UGPTI highlights by the numbers:

9 established program areas.

19 classes offered in the past year attended by 262 students.

27 research publications published in 2007 and 2008 in addition to several refereed journal papers and dissertations.

41 number of government, industry and stakeholder workshops.

49 total number of graduate students enrolled in transportation-related programs, including 22 Ph.D. students (up from six when the program was launched in 2002); 14 masters students in the transportation option programs in agribusiness and applied economics and civil engineering; and 13 in the Masters of Managerial Logistics program.

108 total current UGPTI employees including 43 full-time staff members, 22 part-time employees, 22 undergraduate student employees and 21 graduate student employees.

571 Number of people who attended and provided input during regional workshops on transportation needs and funding decisions hosted by the UGPTI across the state in early 2008.

737 Participants in SURTC training sessions on transit management, risk management and other topics in 2008.

1678 Total number of participants in 29 North Dakota Local Technical Assistance Program training sessions for a total of 15,666 participant hours of training.

4,127 practicing professionals who attended seminars, workshops and short courses offered by the Mountain-Plains Consortium including those offered via the Transportation Learning Network.

Selected Program Accomplishments

RESEARCH

Agricultural Research

North Dakota grain movement. Researchers summarize grain movement reports from each elevator in North Dakota. Annual reports and monthly updates are used to encourage competition within the grain industry and to identify research needs and market trends.

Rail updates. The UGPTI provides the USDA with updated market and service information for the rail section of the weekly Grain Transportation Report.

Quality assurance for ND grain. Researchers developed an overview of the quality assurance programs commonly utilized by the grain and food industry. It is a resource for N.D. grain facilities to use as they seek new opportunities to market North Dakota producers' grain.

Ethanol's road impact. Staff members assessed the demands that a proposed ethanol processing plant would impose on state and county highways. Their computer models predict corn flows from farms to the plant and estimate the improvement needs for individual routes.

Study examines biofuel development and use. State and federal legislative action is necessary if alternative fuels are to become a steadier, viable fuel option, according to a new report on biofuels. The study provides an overview of alternative fuel use and potential in the region along with a cost-benefit analysis of switching from traditional to alternative fuels such as ethanol and biodiesel.

Intelligent Transportation Systems

Regional ITS architecture updates. A regional intelligent transportation system (ITS) architecture provides a framework for supporting ITS deployment by defining services, developing system requirements, identifying information flows, defining and coordinating agency roles, and integrating functions across jurisdictional lines. ATAC has been a resource for the NDDOT and ND MPOs for developing and maintaining their regional ITS architectures.

North/West passage pooled fund study, phase III. The North/West Passage Corridor encompasses the states along I-90/I-94 from Wisconsin to Washington and is an FHWA Transportation Pooled Fund (TPF) Study. ATAC recently developed the North/West Passage Corridor Advanced Traveler Information System (ATIS) website. The purpose of the website is to provide one location to view corridor-wide traveler information and link to additional detailed information for each of the member states.

Traffic Operations

Tri-level ramp operational study. To address congestion in Fargo, ATAC assisted the NDDOT in assessing the operational performance of the existing conditions and various geometric designs between the I-94 & I-29 interchange and the I-94 & 25th St. interchange. The analysis included determining the vehicle paths through the area and simulating various designs for both existing and projected 2030 conditions.

GF school safety study. ATAC conducted pedestrian safety and traffic circulation evaluations at three schools in Grand Forks to provide short- and long-term improvement strategies. Recommendations ranged from updating pavement markings and signage around the schools to making geometrical changes to sidewalks, parking lots, and curbs.

Work zone study. The research examined the application of two classes of traffic analysis models to evaluate the traffic impacts of work zone activities so that safety can be improved.

More ATACid's are used by researchers across the U.S. ATAC's controller interface device (ATACid), developed over several years, has seen a surge in interest and sales. Units have been sold to research centers at the University of Tennessee, University of Minnesota – Duluth, and the City of Edmonton, ON. Other ATACid users include the University of Nevada Las Vegas, University of Virginia, Texas Tech University, and Siemens ITS. The ATACid enables researchers/agencies to model complex traffic control problems using an actual traffic signal control system within a traffic simulation model.

Bus priority. ATAC helped Fargo-Moorhead's Metropolitan Area Transit in assessing the use of traffic signal priority devices on buses. Traffic signal priority (not traffic signal pre-emption used by emergency vehicles) allows buses to emit a signal that allows a green light for the bus in certain situations. The pilot program showed the devices can reduce travel time and improve efficiency. The research also identified routes that could benefit most from the devices.

Metropolitan Transportation Planning

ATAC houses the regional travel demand models of the three metropolitan planning organizations in North Dakota. As such, ATAC provides, maintains, runs and updates these models to support transportation planning activities. Researchers analyzed several corridors and interchanges in the Fargo metropolitan area to assist in designing improvements that will reduce congestion and improve safety. The analysis is also used in long-term transportation planning.

Transit and Personal Mobility

Coordination in southwest North Dakota. UGPTI and the NDDOT are working together to explore possibilities for region-wide coordinated transportation in southwestern North Dakota. The vision is for all transit providers in the region, including schools, private operators, human services, and transit agencies to coordinate services.

Tribal transit needs assessment. UGPTI researchers conducted a needs assessment to help identify the Indian reservations across the nation most in need of transit services. The assessment identified tribal transit needs for the distribution of funding under the 2005 SAFETEA-LU federal highway bill which created a new program (5311c) to provide funding for tribal transit services in non-metropolitan areas.

Biodiesel use in Fargo-Moorhead MAT buses. UGPTI teamed with the Fargo-Moorhead Metropolitan Area Transit (MAT) to determine how beneficial biodiesels really are. The study found that the switch to biodiesel has been a success. Minimal maintenance problems have occurred, and marketing of their biodiesel use has resulted in positive exposure throughout the community.

What's the best transit fit? Agencies that provide transit in small urban and rural areas are being encouraged to coordinate their services. Researchers are trying to determine ways in which transit services can be organized to work best in certain communities or circumstances.

Student attitudes and use of transit. SURTC continued to survey NDSU students on their attitudes toward transit and their use of campus and municipal transit services. The information will be useful as NDSU and other campuses look at enhancing and marketing transit services.

Building a better bus. SURTC has been working with the Federal Transit Administration to bring together bus manufacturers, bus equipment manufacturers, transit agencies, paratransit agencies and others to design a better small bus. The effort grew out of a study of the bus manufacturing industry conducted by SURTC and supported by the FTA.

Mobility of elderly women. Research showed levels of mental acuity and self-efficacy have a significant impact on mobility of elderly women living in rural areas. The research focused on women because their need for mobility is often particularly acute in rural areas.

Transportation Planning

GIS technology assessment. UGPTI researchers collected information from state departments of transportation and metropolitan planning organizations in the mountain-plains region to learn how they were using geographic information systems (GIS) technology in transportation planning. The information will help agencies explore improved uses for this powerful technology and will be a resource for DOTs and MPOs as they look for potential areas of collaboration and cooperation.

Modeling pavement deterioration. UGPTI and University of Wyoming researchers are studying data from highways across the region to develop a computer model that predicts how long various pavements will last, how fast they deteriorate and when they need repair or replacement. The model, designed for cold-weather regions, will help highway planners manage their highway repair and replacement programs.

Estimating road investment needs. The UGPTI and the NDDOT analyzed highway investment needs in North Dakota and estimated the benefits of making the investments. Total investment needs across the state were estimated to be about $539.5 million annually.

Study shows highways inadequate. A study of North Dakota's freight system and freight growth quantifies growth of freight movement in the state over the past 50 years and finds that the state's highway system has not kept pace. The study concludes that ag production, manufacturing and energy production in the state will be hampered if infrastructure concerns are not addressed.

Predicting pavement performance. The UGPTI is updating the NDDOT forecast of pavement performance with a recently developed performance modeling tool. Performance criteria for all the preservation, rehabilitation and reconstruction strategies the NDDOT employs are important to develop and understand in managing the current highway network and planning for the future.

Other Research

Supply chain support. Researchers from UGPTI and the NDSU Department of Industrial and Manufacturing Engineering helped Border States Electric develop a network optimization model to find ways to reduce costs for the Fargo-based electrical supplier while improving response time, reliability and other factors. Several doctoral students were involved in the project.

Targeting safety concerns. Because North Dakota ranks worst in the nation for increased fatalities per drivers' miles traveled per year, the NDDOT's Office of Traffic Safety asked UGPTI to study the issue. The study focused on men age 18 to 34 because they are involved in more fatal crashes than females and other age groups. The researchers focused on two key issues: Driving while impaired by alcohol and seatbelt use. The findings will help the DOT customize media campaigns and education programs for the at-risk drivers' group.

OUTREACH

UGPTI hosts statewide discussion on mobility and transportation. In March and April, the Institute hosted regional workshops in Williston, Dickinson, Minot, Bismarck, Devils Lake, Jamestown, Grand Forks, Mandan and Fargo to discuss mobility needs and the state of North Dakota's transportation infrastructure. Nearly 600 people attended the sessions. A summary of the discussions was presented to the North Dakota Legislature's Interim Transportation Committee in Fargo June 19.

Integrating security into small MPO planning. UGPTI is working with the Fargo-Moorhead Metropolitan Area Planning Organization to develop transportation security plans because planning for disruptions is essential for managing security issues and for promoting safe recovery. The study will help the area meet the U.S. DOT mandate to incorporate security into its planning.

Flagger training. NDLTAP developed flagger-training materials that will be used by all flaggers in North Dakota. The materials include a handbook and a computer-based training presentation. Prior to the first day on the job, all flaggers must view the presentation and pass a short test to be certified.

Training for transportation technicians. The NDDOT, with the support of NDLTAP, provided training for the new transportation technician series within the department. Twenty-eight NDDOT maintenance transportation technicians participated in a 32-hour course, "Introduction to Highway Construction."

Coordination summit held. A Transit Coordination Summit April 9 in Bismarck was sponsored by SURTC and AARP North Dakota. Nearly 100 transit managers, county commissioners, state legislators, human service providers, and department of transportation professionals shared ideas and concerns and heard details about NDDOT's regionalization plan.

Vision Safe Drive Conference held. The first Vision Safe Drive Conference was held in November 2007 in Bismarck. More than 100 leaders and experts in traffic safety from eight states and the District of Columbia exchanged ideas on emerging issues, successes, and challenges. Another conference is scheduled for May 2009 in Rapid City.

Issue briefs published. The Rural Transportation Safety and Security Center has published "Issue Briefs" on rural traffic safety issues. The on-going series highlights key issues and provides background for public policy debate. Briefs have highlighted deer-vehicle collisions, driver drinking, speeding, risky driving behavior by young males, and graduated driver's license programs.

National Summit on Ag and Food Truck Transport. More than 350 transportation and policy experts participated in the National Summits on Agricultural and Food Truck Transport in December 2007 and December 2008 in Washington, DC. The conferences examined the impact of farm and energy policy changes on domestic agricultural production and processing and the ability of commercial agricultural trucking to meet demands of agricultural shippers while facing increasing energy costs, and environmental concerns.

Software for motor carrier safety. UGPTI's TSSC continues to develop and maintain high-quality software for use by federal and state commercial vehicle safety specialists nationwide. The software applications are used by specialists to help in conducting inspections, checking on driver's license status, reviewing information from past inspections, reviewing carriers' safety and violation history, and developing case files for enforcement activities.

Border help. TSSC is working with the Federal Motor Carrier Safety Administration and U.S. Customs and Border Protection to improve truck and bus safety and security at U.S. borders. The center is helping to bridge FMCSA and CBP computer systems and databases to facilitate the clearance of commercial carriers, vehicles and drivers. The goal is to identify and contain unsafe vehicles while speeding the flow of safe vehicles and goods crossing the border.

Setting research agenda for human service transport. At the national Human Service Transportation Research Summit in January 2008, SURTC staff facilitated activities aimed at identifying and prioritizing research opportunities. The staff then used the information to author a national research agenda.

NDinfo.org is an online transportation service directory. Through a contract with the NDDOT, the UGPTI developed a statewide online transportation service directory allowing individuals to access information about transit services across the state.

Dakota Transit Association partnership. SURTC has partnered with the DTA during the past year and has provided enhanced training opportunities, identified strategies to increase funding for member operations, promoted rural transportation nationally, and increased education and advocacy efforts.

Risk management for transit. SURTC has developed a comprehensive training course that addresses four major issues – people, property, reputation, and money – as geared specifically to transit.

Transit coordination. As federal and state mandates push transit agencies and human service agencies to coordinate their services, UGPTI specialists have become the go-to experts for rural agencies. They have developed training on how to develop coordination plans.

Transit safety and security. SURTC staff have been certified by the Community Transportation Association of America to conduct transit safety and security assessments. Reviewers visit transit systems and determine if they meet industry benchmarks for safety and security. In those areas where they fall short of the benchmarks, they offer suggestions on how to improve.

Planning to succeed in the transit business. An intensive business plan training course offered by SURTC provides small urban and rural transit agencies with a jump start on developing a business plan. The course gives transit managers hands-on experience with information that is specific to their own agency.

Introduction to transit management. SURTC developed an "Introduction to Transit Management" course. The course is designed for new transit managers.

TLN doubles technical courses. The TLN reached more than 1,250 people in nine weeks through six work zone safety courses. Attendance has doubled from last year.

TLN introduces Web conferences. The TLN added another aspect to its training offerings by making Web conferences available. This technology allows people to receive training at their own desks, an advancement that will extend TLN's reach.

TLN works with new partners. TLN developed new partnerships with the American Traffic Safety Services Association and the Occupational Safety and Health Administration and expanded its relationships with the Federal Highway Administration and the National Highway Institute.

Concrete information. The UGPTI, through its TLN, launched a series of technical seminars on concrete to improve the skills of workers with the NDDOT, contractors, counties and cities across North Dakota. Topics were selected to address common problems encountered when using concrete in transportation infrastructure projects.

JTRF special transit issue. UGPTI published a special transit issue of the Journal of the Transportation Research Forum. Two articles were authored by UGPTI staff. The issue was sponsored by the American Public Transportation Association.

Traffic Operations Roundtable. ATAC continues to support traffic engineers across North Dakota and the region by hosting semi-annual roundtable meetings. Established in 2004, the roundtable allows peers to share experiences and ideas and identify critical transportation issues. Meetings include general discussions, technical tours, and presentations/training opportunities. These elements provide professional development hours that are applied to licensing certificates.

LTAP Clearinghouse. The UGPTI works with the American Road and Transportation Builders Association in Washington, DC, to manage the National Local Technical Assistance Program/Tribal Technical Assistance Program Clearinghouse. The UGPTI provides technical assistance in upgrading the national LTAP website and is exploring new technology applications and other methods of technology transfer.

EDUCATION

Growth of doctoral program continues. When NDSU launched its doctoral program in Transportation and Logistics in 2002, six students were enrolled. During the 2007-2008 academic year, enrollment was 23 students.

Scholarships awarded. Four $1,500 scholarships are funded each year at NDSU by the Mountain-Plains Consortium. Twenty-six scholarships have been awarded since they were established in 2002.

Managerial logistics. The UGPTI coordinates the NDSU Masters of Managerial Logistics program. This intensive 12-month program is intended primarily for military officers and Department of Defense civilians. In October, the name of the program was renamed from Masters of Military Logistics to reflect the broader nature of the program.

Student activities.

- Ph.D. student Xianzhe Chen was nominated for the IBM Fellowship Program.
- Ph.D. Students Yolanda Carson and Chris Enyinda and NDSU faculty member Won Koo received a best paper award at the Global Academy of Business and Economic Research International Conference in September 2008.
- Ph.D. student Subhro Mitra won a geographic information systems student paper contest sponsored by the American Association of State Highway and Transportation Officials.
- Ph.D. student Junwook Chi was awarded the Transportation Research Forum's Graduate Paper Award.
- Master's degree student Natalie (Beck) Easterday was named SURTC's Outstanding Student of the Year by the U.S. Department of Transportation University Transportation Center program.
- Ph.D. student Marc Scott gained hands-on experience as an intern at the Transit Authority of River City in Louisville, KY, during the summer of 2008.

MPC and TLN offer more graduate courses. The courses address transportation career tracks that demand more advanced knowledge. The courses were:

- *Airport Planning and Design* - South Dakota State University
- *Public Transportation* - North Dakota State University
- *Transportation Modeling*- University of Utah
- *Pavement Materials* - University of Wyoming

New graduate program under development. The UGPTI is working with the NDSU College of Graduate and Interdisciplinary Studies to develop a Transportation and Urban Systems degree program. The program, if approved, will include a master of science in transportation and urban systems as well as a certificate in transportation and urban systems.

Seminar series continues. The UGPTI continues to sponsor a series of transportation related seminars during the academic year. The seminars provide helpful updates on transportation research and issues at the local, regional and national level.

Real-world design. DOTSC utilizes civil and construction engineering student interns to develop highway improvement projects.

- Nine design projects completed in the last year by DOTSC students were built during the 2008 construction season.

- Of the 18 engineering students that worked at the DOTSC in the past year 10 graduated and are active in the engineering field: seven work for the NDDOT, one is pursuing a graduate degree from NDSU, one is employed at the Missouri DOT, and one went to work for BNSF Railroad.

Activity sheet project. In May 2007, the DOTSC information technology students started work on a Web-based project creation and ranking system for NDDOT. Each biennium, activity sheets for projects are to be created outlining purpose and costs. Finalized activity sheets will be brought to the ND state legislature for budgeting.

UGPTI Future Directions 2009-2011

Secure additional funding and construct Center for Transportation Studies building: Institute staff are housed in three separate buildings on the NDSU campus, limiting their ability to collaborate and share resources. Currently we do not have space to resolve this issue. Finding the remaining funds for a transportation center that will allow the UGPTI to add greater value to North Dakota will be of the highest importance.

Successfully re-compete for regional university transportation center: The Mountain-Plains Consortium (MPC), the Region 8 university transportation center sponsored by the U.S. Department of Transportation, is critical to the long run success of the UGPTI. Positioning the Institute and the MPC for winning the competition will be a first-order priority.

Reauthorize SURTC and RTSSC: The Small Urban and Rural Transit Center and the Rural Transportation Safety and Security Center, programs which make important contributions to mobility, both were authorized and funded as part of SAFETEA-LU. This law expires September 2009 and every effort will be made to assure these programs are included in the new surface transportation bill.

Implement new master's degree in transportation and urban systems: This third degree will round out the graduate education program in transportation at NDSU, complementing the doctorate in transportation and logistics and the master's of managerial logistics. Implementation of this degree will put the transportation education program at NDSU among the elite academic transportation programs at major universities in the United States.

Work with the NDSU administration to create a School of Transportation within the academy: A school will provide a focal point for administering, managing, and marketing the transportation education program within NDSU. What's more, it will symbolize the importance of mobility to our socioeconomic system, and promote interdisciplinary research projects and programs.

Create a new center for transportation applications in sensing and RFID: A modern well-managed transportation system will be dependent on sensing the environment and condition of infrastructure and other factors to enhance operations. The same is true of a cutting edge supply chain. The Institute is uniquely positioned to take advantage of the intellectual capital and facilities at NDSU to make advances in this field with a particular emphasis on RFID.

Develop a transportation security and terrorism program: The U.S. transportation system is vulnerable to terrorism in both rural and urban settings. The Institute has a unique opportunity to establish a nationally recognized program. The UGPTI will work with local and state officials to develop a center that will conduct research to identify strategies and educate and train people to recognize weak points and take corrective actions.

Fully develop the Center for Waterway Freight Analysis: The Corps of Engineers has selected four universities to conduct economic analysis and manage waterborne commerce data - Texas A&M, University of Tennessee, Marshall University, and NDSU. The Institute has been assigned the upper Mississippi, Illinois and Columbia waterways, all of which are important to agriculture.

Develop a three-year multi-modal planning research project: Multi-modal planning, development, and operation of the nation's transportation system are essential to optimize the use of that system and to achieve the national goals of energy independence, reduction of greenhouse gases, and economic efficiency. The institute will partner with OnTrack America and Penn State to develop a planning process and conduct demonstration projects on a state level.

Expand the Advanced Traffic Analysis Center: There is a growing need to apply advanced traffic analysis and management techniques in small- and medium-sized cities so that they can avoid the longer-term problems of congestion and inefficiency. ATAC will adopt a strategy of adding value to these population centers by partnering with other universities and strengthening their program on a national basis.

Improve marketing and partnerships of the transportation education program: Many potential students are not aware of the opportunities to study transportation at the graduate level at NDSU. Additionally, there seems to be a number of potential opportunities to partner with U.S. and foreign universities in transportation education. This effort addresses both of these issues.

Continue to search for funding for agricultural transportation research and outreach: Although individual issues have changed, agricultural transportation issues are as important today as they were 30 years ago. Securing funding to address these issues has been the institute's greatest challenge. A continued effort will be made to fund USDA's university agricultural transportation research and education program.

BUDGET, EXECUTIVE RECOMMENDATION AND REQUEST

Although the executive recommendation for General Funds indicated in the budget summary below will not cover all of the administrative costs of the UGPTI, it will enhance its base budget and improve its ability to compete for contracts and grants.

The Institute would like to respectfully request concurrence of the House with the additional spending authority in the amount of $3.0 million for the Center for Transportation Studies building as amended by the Senate. The UGPTI Center for Transportation Studies has been a requested project in the NDSU Campus Master Plan since 2000. It was listed as an approved *Non-State Funded Project Recommended for Inclusion in the 2007-09 Budget Request* for UGPTI and was included in section 3 of HB1020 authorized during the 2007-09 Legislative Assembly in the amount of $5,500,000. UGPTI has since retained an architect to develop plans for the facility in order to obtain a more accurate cost estimate for the project. Because of an increase in size, and due to the increased cost of materials and services since the initial estimation for the facility, UGPTI is requesting that the project now be authorized at $8,500,000. The project is ready to go, the final plans and engineering have been completed, a site has been selected, it is on the STIP, and it is ready to bid. We are hopeful that we can raise the remaining funds through the stimulus package, but we do need additional authority.

	2007-09 Budget	2009-11 Executive Recommendation	Senate Amendment	SB 2020 as Amended
Total All Fund	$27,571,521.00	$23,326,992.00	$3,000,000.00	$26,326,992.00
Less Estimated Income	$26,361,681.00	$21,737,199.00	$3,000,000.00	$24,737,199.00
Total General Funds	$1,209,840.00	$1,589,793.00		$1,589,793.00
One Time Funding Item				
Capital Assets	$5,500,000.00		$3,000,000.00	$3,000,000.00