Transportation and Urban Systems

Program and Application Information
Program Director: Dr. Denver Tolliver
Assistant to the Director of Educational Programs: Jody Bohn Baldock
Email: jody.bohn.baldock@ndsu.edu
Department Location: Upper Great Plains Transportation Institute
Department Phone: (701) 231-7938
Department Web Site: www.ndsu.edu/transportation/tus/
Application Deadline: July 1 for fall semester, December 1 for spring semester
Degrees Offered: M.S., M.T.U.S., Certificate
English Proficiency Requirements: TOEFL iBT 71; IELTS 6

Program Description
North Dakota State University offers an interdisciplinary program leading to a Master of Science (M.S.) in Transportation and Urban Systems, a Master of Transportation and Urban Systems (MTUS), and a Certificate in Transportation and Urban Systems. The program is a collaborative effort of several colleges and includes faculty from Agribusiness & Applied Economics; Civil Engineering; Computer Science and Operations Research; Emergency Management; Industrial and Manufacturing Engineering; Management and Marketing; Geosciences; and the Upper Great Plains Transportation Institute.

Master of Science (M.S.) in Transportation and Urban Systems
This degree focuses on: (1) urban transportation systems; (2) relationships between transportation, land use, environment, emergency response, and logistical delivery systems; (3) coordinated planning, operations, and security; and (4) the spatial dimensions of urban systems. The curriculum is built around the topics of public transportation systems, geographic information systems, freight transportation and logistical delivery systems, urban geography and land use, the environmental impacts of transportation systems, transportation systems security, and the sustainability of transportation and urban systems.

The M.S. degree requires a thesis and is targeted at students with strong research interests.

Master of Transportation and Urban Systems (MTUS)
This is a non-disquisition degree that is primarily intended for professional planners and engineers. Students in the M.S. and MTUS programs can select from a common set of courses. However, students enrolled in the non-disquisition (MTUS) program have more opportunities for synthesis of practice and additional course work, with less emphasis on research. Students in this option are required to complete a creative component as coordinated with their adviser.

Certificate in Transportation and Urban Systems
The certificate in Transportation & Urban Systems is primarily targeted at practicing professionals who wish to gain additional knowledge in the emerging fields of transportation and urban systems. The certificate requires a minimum of nine (9) course credits that can be selected from a list of online courses, including Transportation Systems Security, Transportation Planning and Environmental Compliance, Transportation System Modeling, Urban Transportation Systems Analysis, Context Sensitive Solutions, Transportation Systems Lavatory, Public Transportation, and Public Transportation II.

Admission Requirements
The Transportation and Urban Systems master’s program is open to qualified graduates of universities and colleges of recognized standing. In addition to the Graduate School admission requirements, the applicant must have adequate preparation in one or more of the disciplines comprising Transportation and Logistics, a stated interest in transportation, the capability to conduct transportation research, and professional experience or interests in community practice.

Students will be accepted from many disciplinary backgrounds, including (but not limited to) architecture, business, civil engineering, environmental engineering or science, geography, government, political science, sociology, and urban affairs. Acceptance is on an individualized basis.

Degree Requirements
Master of Science
A minimum of 30 credits is required for the degree. At least 16 of these credits must be completed using approved courses numbered from 601-689, 691, 700-789. All students must take a final examination which covers the course work taken by the candidate, as well as the thesis topic as coordinated with their adviser.

Each thesis will contribute new models or knowledge. The former may be achieved through the synthesis of several techniques, the modification of existing models, or new applications of analytical techniques to transportation/urban problems. The latter may be accomplished through the collection and analysis of original data or the development of innovative planning techniques. Each thesis must be of sufficient depth and quality to warrant at least six (6) graduate credits. However, no more than 10 credits can be earned for any thesis.

**Master of Transportation and Urban Systems**

The Master of Transportation and Urban Systems degree is a non-thesis degree. However, each student must complete a creative component, which can be a case study, practicum, or paper. In the creative component, a student may develop a case study of a metropolitan region, transit system, or public program. Case studies may include: (1) comprehensive transportation planning processes in metropolitan areas, (2) urban transit systems or operations, (3) emergency or disaster response case studies or plans, (4) security programs or issues, and (5) integrated transportation/environmental plans. The case study must be approved by the student’s adviser and should involve transportation and community professionals from federal, state, or local agencies, or private industries. In lieu of a case study, the adviser may approve other activities or outcomes that would comprise the creative component.

A minimum of 30 credits is required for the Master of Transportation and Urban Systems degree. At least 21 of these credits must be completed using approved courses numbered from 601-689, 691, 700-789, and 791. A minimum of two (2) credits and a maximum of four (4) credits will be awarded for the creative component.

**Certificate Requirements**

The certificate in Transportation and Urban Systems will consist of a minimum of nine (9) course credits selected from the list of online courses. At present, this list includes: TL 751 Transportation Systems Security, TL 752 Transportation Planning and Environmental Compliance, TL 753 Transportation System Modeling, TL 754 Urban Transportation Systems Analysis, TL 755 Context Sensitive Solutions, TL 756 Transportation Systems Laboratory, TL 786 Public Transportation I and II. Additional courses may be offered online in the future.

Requirements for the degree will be met by each student formulating their plan of study utilizing the following courses as required.

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Credits</th>
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<tbody>
<tr>
<td>TL 751</td>
<td>3</td>
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<tr>
<td>Transportation Systems Security</td>
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<td>TL 752</td>
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<td>Transportation Planning and Environmental Compliance</td>
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<td>TL 753</td>
<td>3</td>
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<tr>
<td>Transportation System Modeling</td>
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<tr>
<td>TL 754</td>
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<tr>
<td>Urban Transportation Systems Analysis</td>
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<td>TL 755</td>
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<tr>
<td>Context Sensitive Solutions</td>
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<tr>
<td>TL 756</td>
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<tr>
<td>Transportation Systems Laboratory</td>
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<td>TL 786</td>
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<tr>
<td>Public Transportation</td>
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<tr>
<td>TL 787</td>
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<tr>
<td>Public Transportation II</td>
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<tr>
<th>Electives</th>
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<tbody>
<tr>
<td>TL 711</td>
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<tr>
<td>Logistics Systems</td>
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<td>TL 721</td>
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<tr>
<td>International Logistics Management</td>
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<td>TL 723</td>
<td>3</td>
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<tr>
<td>Advanced Supply-Chain Planning Across the Enterprise</td>
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<tr>
<td>TL 729</td>
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<tr>
<td>Adaptive Planning in Logistics Systems</td>
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<td>TL 731</td>
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<tr>
<td>Logistics Decision Analysis</td>
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<tr>
<td>TL 735</td>
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<tr>
<td>Acquisition Contracts: Law and Management</td>
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<tr>
<td>TL 789</td>
<td>1</td>
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<tr>
<td>Leadership, Ethics, and Academic Conduct in Transportation</td>
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<tr>
<td>TL 798 or TL 797</td>
<td>3</td>
</tr>
<tr>
<td>Master's Thesis</td>
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<tr>
<td>or Master's Paper</td>
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**Areas of focus**

**Spacial Analysis**

<table>
<thead>
<tr>
<th>GEOG 655</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Introduction to Geographic Information Systems</td>
<td>4</td>
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<tr>
<td>GEOG 656</td>
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<tr>
<td>Advanced Geographic Information Systems</td>
<td>3</td>
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</tbody>
</table>
Information Systems Technologies

TL 725 Technology Advances and Logistics

Enterprise Management

TL 715 Enterprise Resource Planning
TL 727 Organizational Change Management

Transportation Planning

CE 780 Transportation Planning

Emergency Response and Disaster

TL 719 Crisis Analysis and Homeland Security

Canan Bilen-Green, Ph.D.
University of Wyoming, 1998
Department: Industrial and Manufacturing Engineering

John Bitzan, Ph.D.
University of Wisconsin-Milwaukee, 1997
Research Interests: Transportation Economics
Department: Management and Marketing

Alan Dybing, Ph.D.
North Dakota State University, 2013
Research Interests: Asset Management, Energy Impacts, Freight Transportation, Agricultural Transportation, Supply Chain Management, Transportation Economics, Spatial Analysis, Transportation Systems Modeling
Department: Upper Great Plains Transportation Institute

Gokhan Egilmez, Ph.D.
Ohio University, 2012
Research Interests: Problems of Multidisciplinary Domains Including Manufacturing, Supply Chains, Energy, Food & Agriculture, Transportation and Built Environment From Triple Bottom Line (Socio Economic And Environmental) Sustainability Point of View by Using Novel Research Methods Such as Life Cycle Assessment (LCA), Regional, National and Multi Region Input Output Analysis (RIO, NIOA, And MRIO), Data Envelopment Analysis (DEA), System Dynamics (SD), Carbon, Energy, Water and Ecological Footprint Analysis, Multi-Criteria Decision Making, Goal Programming and Fuzzy Set Theory
Department: Industrial and Manufacturing Engineering

Kambiz Farahmand, PhD, PE
University of Texas at Arlington, 1992
Department: Industrial and Manufacturing Engineering

Robert Hearne, Ph.D.
University of Minnesota, 1995
Research Interests: Natural Resource and Environmental Economics
Department: Agribusiness and Applied Economics

Siew Hoon Lim, Ph.D.
University of Georgia, 2005
Research Interests: Production Economics, Transportation, Industrial Organization
Department: Agribusiness and Applied Economics

Jill Hough, Ph.D.
University of California-Davis, 2007
Research Interests: Public Transportation, Travel Behavior, Built Environment, Accessibility and Mobility of Seniors
Department: Upper Great Plains Transportation Institute

Ying Huang, Ph.D.
North Dakota State University, 2015
Research Interests: Intelligent Transportation Systems, Pavement and Pipeline Performance Evaluation, Vehicle Identification and Traffic Analysis, Structural Health Monitoring/Smart Structures for Transportation Infrastructure, Applications of Adaptive and Smart Materials, Multi-Hazard Assessment and Mitigation
Department: Civil and Environmental Engineering

Daniel J. Klenow, Ph.D.
North Dakota State University
Department: Emergency Management

Won Koo, Ph.D.
Iowa State University, 1974
Research Interests: International Trade

Brenda Lantz, Ph.D.
Pennsylvania State University, 2006
Department: Upper Great Plains Transportation Institute

EunSu Lee, Ph.D.
North Dakota State University, 2011
Research Interests: Transportation Systems Modeling, Informatics, Spatial Analysis, Logistics, Supply Chain Management, Industrial Engineering
Department: Upper Great Plains Transportation Institute

Pan Lu, Ph.D.
North Dakota State University, 2011
Department: Upper Great Plains Transportation Institute

Diomo Motuba, Ph.D.
North Dakota State University, 2009
Research Interests: Transportation Economics, Transportation Systems Modeling, Freight Transportation, Econometrics, Logistics, Supply Chain Management
Department: Upper Great Plains Transportation Institute

Kendall E. Nygard, Ph.D.
Virginia Polytechnic Institute, 1978
Research Interests: Advanced Technologies in Logistics, Optimization Modeling, Simulation Modeling, Data Science and Computational Methods
Department: Computer Science and Operations Research

Peter O’Dour, Ph.D.
University of Missouri-Rolla, 2004
Research Interests: GIS, Groundwater contamination, Remote sensing
Department: Geosciences

David C. Roberts, Ph.D.
Oklahoma State University, 2009
Research Interests: Impacts of Agricultural Production Methods on the Environment and Natural Resources, Economics of Precision Agriculture Technologies and the Response of Cropping Patterns, Land Use Change to Emerging Biofuels Policy at the Federal Level
Department: Agribusiness and Applied Economics

Joseph Szmerekovsky, Ph.D.
Case Western Reserve University, 2003
Research Interests: Project Management and Scheduling, Complex Systems and Flexible Manufacturing and Using Linear and Nonlinear Dynamic and Integer Programming and Network Flows
Department: Management and Marketing

Denver D. Tolliver, Ph.D.
Virginia Polytechnic University, 1989  
Research Interests: Transportation Systems Planning, Freight Transportation, Economic Analysis  
Department: Upper Great Plains Transportation Institute

Rodney D. Traub, Ph.D.  
Purdue University, 1994  
Field: Operations Management  
Department: Management and Marketing

Kim Vachal, Ph.D.  
George Mason University, 2005  
Research Interests: Policy, Economics, Regional Development  
Department: Upper Great Plains Transportation Institute

Amiy Varma, Ph.D.  
Purdue University, 1993  
Research Interests: Transportation Systems and Planning, Traffic Engineering, Airports, and Infrastructure Management  
Department: Civil Engineering

David L. Wells, Ph.D.  
University of Missouri-Rolla, 1996  
Department: Industrial and Manufacturing Engineering

William W. Wilson, Ph.D.  
University of Manitoba, 1980  
Research Interests: Commodity Marketing, Agribusiness, Industrial Organization  
Department: Agribusiness and Applied Economics

Frank Yazdani, Ph.D., PE  
University of New Mexico, 1987  
Research Interests: Structural Engineering/Mechanics, Constitutive Modeling of Materials, Damage Mechanics, Plasticity, Computational Plasticity, Finite Elements, Concrete and Masonry Materials  
Department: Civil Engineering