

# Transportation and Urban Systems

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## Program and Application Information

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

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## 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 Laboratory, 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.

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

#### **Core Courses**

TL 751	Transportation Systems Security	3
TL 752	Transportation Planning and Environmental Compliance	3
TL 753	Transportation System Modeling	3
TL 754	Urban Transportation Systems Analysis	3
TL 755	Context Sensitive Solutions	2
TL 756	Transportation Systems Laboratory	3
TL 786	Public Transportation	3
TL 787	Public Transportation II	3

#### **Electives**

TL 711	Logistics Systems	4
TL 721	International Logistics Management	4
TL 723	Advanced Supply-Chain Planning Across the Enterprise	3
TL 729	Adaptive Planning in Logistics Systems	3
TL 731	Logistics Decision Analysis	3
TL 735	Acquisition Contracts: Law and Management	3
TL 789	Leadership, Ethics, and Academic Conduct in Transportation	1
TL 798	Master's Thesis	3
or TL 797	Master's Paper	

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## **Areas of focus**

### **Spacial Analysis**

GEOG 655	Introduction to Geographic Information Systems	4
GEOG 656	Advanced Geographic Information Systems	3

TL 785	Spatial Analysis in Transportation	3
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### Information Systems Technologies

TL 725	Technology Advances and Logistics	3
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### Enterprise Management

TL 715	Enterprise Resource Planning	3
TL 727	Organizational Change Management	3

### Transportation Planning

CE 780	Transportation Planning	3
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### Emergency Response and Disaster

TL 719	Crisis Analysis and Homeland Security	3
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#### Canan Bilen-Green, Ph.D.

University of Wyoming, 1998

Research Interests: Quality and Reliability Engineering, Design and Auditing of Quality and Productivity Monitoring Systems, Statistical Modeling and Applications, Applied Operations Research

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

Research Interests: Productivity Improvement of Manufacturing Systems, Lean Manufacturing and implementation, Ergonomics, Safety and Human Factors Engineering, Human Exposure and Physiology Simulation, Simulation and Modeling, Facilities and Production Layout Planning, Operations & Materials Logistics Management and Strategic Planning, ISO and QS 9000 standards, and Healthcare Management

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

Research Interests: Social Vulnerability and Functional Needs Populations, Homeland Security and Terrorism, Tornado Vulnerability, Disaster Preparedness, Response, and Recovery

Department: Emergency Management

**Won Koo, Ph.D.**

Iowa State University, 1974

Research Interests: International Trade

**Brenda Lantz, Ph.D.**

Pennsylvania State University, 2006

Research Interests: Commercial Vehicle Safety Systems and Analysis, Supply Chain, Intelligent Transportation Systems for Commercial Vehicle Operations, and Statistical Modeling and Diagnostics.

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

Research Interests: Asset Management, Freight Transportation, Statistical Modeling and Applications, Multi-Modal Transportation, Applied Operation Research

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

Research Interests: International Studies in Manufacturing Technology, Strategic Management, Economic Development Strategies

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