Transportation and Urban Systems

Department Information

- **Program Director:**
  Denver Tolliver, Ph.D.
- **Department Chair:**
  Joseph Szmerekovsky, Ph.D.
- **Academic Coordinator:**
  Jody Bohn Baldock
- **Email:**
  jody.bohn.baldock@ndsu.edu
- **Department Location:**
  Upper Great Plains Transportation Institute, QBB 448
- **Department Phone:**
  (701) 231-7767
- **Department Web Site:**
  www.ndsu.edu/business/departments/tl/
- **Application Deadline:**
  July 1 for fall semester, December 1 for spring semester
- **Degrees Offered:**
  M.S., M.T.U.S., Certificate - All programs offered online only
- **English Proficiency Requirements:**
  TOEFL iBT 71; IELTS 6

Program Description

The Department of Transportation and Logistics offers a Master of Science in Transportation and Urban Systems, a Master of Transportation and Urban Systems and a Certificate in Transportation and Urban Systems. The degree is awarded through the College of Business, which collaborates with the Upper Great Plains Transportation Institute to provide high-quality graduate programs for students. The program takes an interdisciplinary approach to transportation and logistics and attracts students with backgrounds in transportation and logistics, as well as agribusiness, applied economics, civil engineering, construction management, emergency management, finance, geosciences, industrial/manufacturing engineering, and supply chain management.

**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 advisor.

**Certificate in Transportation and Urban Systems**

The Certificate in Transportation and 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 9 course credits from the list of core courses.

Admission Requirements

The Transportation and Urban Systems programs are open to qualified graduates of universities and colleges of recognized standing. To be admitted with full standing, the applicant must:
Transportation and Urban Systems

1. Hold a baccalaureate degree from an educational institution of recognized learning with a minimum grade point average (GPA) of 3.0 or equivalent
2. Have adequate preparation in one or more of the disciplines comprising transportation and logistics and must have professional experience or interests in community practice
3. Have shown the potential to undertake advanced study as evidenced by prior academic performance and have a stated interest in transportation and (for the M.S.) the capability to conduct transportation research
4. Submit official transcripts
5. Submit a two-page resume
6. Submit a one-page "Letter of Intent" outlying your reasons for pursuing the Master of Transportation and Urban Systems
7. Submit three letters of recommendation (NA for Certificate Option)
8. Submit online application through the NDSU Graduate School website
9. International applicants whose first language is not English and who do not possess an U.S. bachelor's degree or higher are subject to additional requirements when they apply for admission. They must meet the minimum requirements on measures of general English language proficiency. The accepted measures of language proficiency are the TOEFL ibT 71 and IELTS 6.

Apply for Admission
To apply for admission, please visit the Admission Information page (https://bulletin.ndsu.edu/graduate/admission-information).

Degree Requirements

Master of Science (M.S.) in Transportation and Urban Systems
A minimum of 30 credits is required for the degree of which 21 must be core courses and 3 credits of electives. 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 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. Each thesis will contribute one of the following:

- New models – may be achieved through the synthesis of several techniques, the modification of existing models, or new applications of analytical techniques to transportation/urban problems.
- Knowledge – may be accomplished through the collection and analysis of original data or the development of innovative planning techniques.

Master of Transportation and Urban Systems (MTUS)
MTUS 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
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 degree of which 21 must be core courses and 7 credits of electives. A minimum of two (2) credits and a maximum of four (4) credits will be awarded for the creative component.

Certificate in Transportation and Urban Systems
The certificate in Transportation and Urban Systems will consist of a minimum of 9 credits selected from the core courses below. Additional courses may be offered online in the future.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL 751</td>
<td>Transportation Systems Security</td>
<td>3</td>
</tr>
</tbody>
</table>
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  3
TL 756  Transportation and Land Use Integration  3
TL 757  Intelligent Transportation Solutions  3
TL 786  Public Transportation  3
TL 787  Public Transportation II  3

Electives (for M.S. and MTUS)
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  Practical Data Analytics  3
TL 789  Leadership, Ethics, and Academic Conduct in Transportation  3

Creative Component (for M.S. and MTUS)
TL 798  Master's Thesis  3
or TL 797  Master's Paper  3

Areas of Focus (for M.S. and MTUS)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 655</td>
<td>Introduction to Geographic Information Systems</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 656</td>
<td>Advanced Geographic Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>TL 785</td>
<td>Spatial Analysis in Transportation</td>
<td>3</td>
</tr>
<tr>
<td>TL 725</td>
<td>ERP Configuration</td>
<td>3</td>
</tr>
<tr>
<td>TL 735</td>
<td>Practical Data Analytics</td>
<td>3</td>
</tr>
<tr>
<td>TL 715</td>
<td>Introduction to ERP</td>
<td>3</td>
</tr>
<tr>
<td>TL 727</td>
<td>Organizational Change Management</td>
<td>3</td>
</tr>
<tr>
<td>CE 780</td>
<td>Transportation Planning</td>
<td>3</td>
</tr>
<tr>
<td>TL 719</td>
<td>Crisis Analysis and Homeland Security</td>
<td>3</td>
</tr>
</tbody>
</table>

Faculty

Raj Bridgelall, Ph.D.
North Dakota State University, 2015
Research Interests: Big Data Analytics, Internet-of-Things (IoT), Cloud Computing; Connected and Autonomous Vehicles (CAV), Shared Mobility, Intelligent Transportation Solutions; Signal processing and mathematical modeling of transportation systems; Remote Sensing with Unmanned Aircraft Systems; Hyperspectral Image Analysis; Radio-frequency identification (RFID); Real-time locating systems (RTLS); Energy Harvesting and massive scale autonomous wireless sensor networks

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

Ranjit Godavarthy, Ph.D.
Kansas State University, 2012
Research Interests: Public transportation in small urban and rural areas, Demand response transit and paratransit research, Bike share research, Roundabouts research, Traffic engineering and operations, Transportation and highway safety

Jill Hough, Ph.D.
University of California-Davis, 2007
Research Interests: Public transportation in rural and small urban locations, Workforce development, Mobility of the aging, Transportation planning and policy, Intelligent transportation systems

Pan Lu, Ph.D.
North Dakota State University, 2011
Research Interests: Connected and autonomous vehicles, Smart material and structure health monitoring, Big data analytics for transportation, Smart transportation, Transportation system, Asset management, Multimodal transportation, Geospatial transportation modeling

Jeremy Mattson, Ph.D.
North Dakota State University, 2017
Research Interests: Public transportation, Transportation economics, Demand modeling, Travel behavior, Built environment

Diomo Motuba, Ph.D.
North Dakota State University, 2009
Research Interests: Transportation and land use planning, Freight modeling, Transportation economics, Connected automated vehicles, Logistics and supply chain management, Transportation safety

Joseph Szmerekovsky, Ph.D.
Case Western Reserve University, 2003
Research Interests: Project management and scheduling, Supply chain management and technology, Energy supply chain management, Healthcare logistics

Denver Tolliver, Ph.D.
Virginia Polytechnic Institute and State University, 1989
Research Interests: Highway systems modeling, Multimodal transportation planning, Freight transportation, Energy and environmental analysis

Kimberly Vachal, Ph.D.
George Mason University, 2005
Research Interests: Human factors in traffic safety, Healthy community transport, Agricultural and biofuels transportation, CMV safety & security, Containerized and identity preserved grain marketing, Regional economic development