

COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY

DEPARTMENT OF TRANSPORTATION STUDIES

GENERAL INFORMATION

Graduate study in Transportation Planning and Management at Texas Southern University focuses on developing an interdisciplinary program designed to train outstanding students for successful careers in the field of Transportation. Programmatic emphasis is on preparing the student to enter the public and private sector with considerable training and advanced knowledge concerning transportation planning and policy, highway traffic operations, transportation systems and technology, transportation logistics and management, maritime transportation management and security, and homeland security. Emphasis is on technical and economic as well as public policy aspects of transportation systems.

For those focusing on planning or operations careers, the TSU transportation program has a strong foundation in traffic operations, transportation planning, public transportation and Intelligent Transportation Systems (ITS). Students may structure degree programs to build on these strengths. For those pursuing management careers, TSU transportation programs have strong foundations in transportation principles, transportation systems and technologies, highway traffic operations, economics and finance, logistics, maritime transportation, homeland security, and transportation policy and management.

Through a rigorous graduate program of instruction, students will develop problem solving and analytical thinking skills by study of transport system design, planning, and analysis. Students will also master appropriate research skills for use in both public and private transportation-related agencies and organizations. Graduate students and their faculty advisors will form research partnerships based upon their particular interest and the current needs of the transportation industry.

Majors in transportation are provided with unique opportunities to work with transportation experts through the Center for Transportation Training and Research (CTTR), the National Transportation Security Center of Excellence for Petrochemical (NTSCE-P), and the Innovative Transportation Research Institute (ITRI) at Texas Southern University. The CTTR, NTSCE-P and ITRI provide training programs with specialized internships and research opportunities through ongoing applied and empirical research and include demonstration activities.

VISION

We envision an education, research, training, and technology transfer program designed to develop a skilled and educated workforce that is highly competitive in a global market. The academic research and training program serves as an important resource of traffic and transportation engineers, planners, systems analyst, policy makers, business and industry leaders, logistics specialists, port managers, and security specialists for local, state, and federal governments, community organizations and agencies, and consulting companies in the nation.

MISSION

In keeping with the traditional and urban mission of Texas Southern University, the Division of Transportation Studies in the College of Science and Technology will provide education that builds on the latest data, systems and technologies in transportation. In preparing the next generation of transportation professionals, particular attention will be given to attracting and retaining individuals who represent diverse backgrounds socially, economically, and academically, and especially those who have not been well represented among transportation professionals in the past. There is a strong commitment to partnership development and a climate wherein various racial/ethnic and culturally diverse groups can develop their full potential.

GOALS AND OBJECTIVES

The primary goal of the academic program is to educate transportation planners, engineers, specialists, and managers who are able to plan, functionally design, and operate facilities and systems which satisfy the demand for both passenger and freight transportation services. To fulfill both the traditional and urban mission of Texas Southern University, the Transportation Studies Department has established strategic planning initiatives to fulfill both short and long term needs. The Transportation Studies Department shall

- Improve and expand transportation education, training and research.
- Advance technology transfer and expertise.
- Foster sound linkages between the department, other University units, and the public and the private transportation sectors.

- Participate in local, state and federal research and training initiatives.

The principal objectives of graduate study in transportation are (1) to provide students with the professional knowledge and skills needed to compete successfully in a global economy; (2) to enhance students' abilities to develop creative solutions to complex problems in the context of socioeconomic and environmental considerations; and (3) to develop innovative ways to address transportation needs and problems.

The central focus of the academic program is to identify and respond to the training needs of the transportation industry; provide an environment which enables students to develop maximum potential; encourage visionary and creative thinking; provide varied internships and research opportunities which acquaint students with human knowledge and actual work experiences; offer transportation education and training programs directed toward career development in cooperation with business, industry, labor, and public service agencies; and identify and meet professional and in service training needs through specialized short-courses, conferences, symposia, and/or seminars.

REQUIREMENTS FOR ADMISSION

Applicants must hold a bachelor's degree from an institution of acceptable standing and have a grade point average point of "B" or better in work completed during the last two years of undergraduate study. The applicant who will receive the bachelor's degree at the end of the semester or term when applying for admission will be considered for a conditional admission. The bachelor's degree may be in engineering, natural sciences, urban/city planning, business, public administration, political studies, geography, sociology, airway science/aviation, avionics, economics, or other transportation-related fields.

The applicant must meet the criteria for admission to the Graduate School. Applications cannot be evaluated until these requirements are met and the Graduate School receives the completed application. Application for admission forms may be obtained from: The Graduate School, Texas Southern University, 3100 Cleburne Avenue, Houston, Texas 77004. For information call the Graduate School at (713) 313-7233, or visit the department website and detailed information on the application steps can be found and downloaded at <http://transportation.tsu.edu/>.

ADMISSION OF INTERNATIONAL STUDENTS

Applications from international students are evaluated in the same manner as those of students from the United States. However, international students who have not received any degree or diploma in an institution whose official language is English must satisfactorily pass the Test of English as a Foreign Language (TOEFL) examination. This requirement is designed to determine whether or not students have a sufficient command of English to enable them to pursue their graduate studies effectively.

DEGREE REQUIREMENTS

The Master of Science in Transportation Planning and Management degree program is structured to provide a common core of educational and training experiences as well as to provide the flexibility for interfacing with a variety of related disciplines. Efforts are made to equip students with the basic analytical, managerial, and planning competencies necessary either to work in the transportation industry immediately or to advance to doctoral study successfully.

BASIC REQUIREMENTS

- 1 Completion of a total of thirty-nine (39) semester credit hours of prescribed coursework.
- 2 A minimum 3.0 (A = 4.00) quality point average for all graduate work attempted.
- 3 Demonstration of acceptable grasp of the core courses by successful completion of the written comprehensive examination.
- 4 Completion of an internship/project report for all non-thesis option students.
- 5 Completion and successful defense of a thesis with the quality of scientific research for all thesis option students.
- 6 Demonstration of English proficiency by successfully completing the course English 501 Graduate Professional Writing, or by taking Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT) and getting score 3.5 or better on the analytical writing portion of the GRE or GMAT.
- 7 All other requirements of the Graduate School in Texas Southern University.

COMPUTER LITERACY

Students will be exposed to uses of computers and computer packages in transportation as part of the curricula. Emphasis is on personal and microcomputers. Students will use packages in highway capacity, traffic signal timing and coordination, traffic simulation and travel demand models in required course work. Students have access to TSU's personal computer laboratories with access to the Internet.

THESIS

The culmination of the program is the successful completion and defense of a thesis which is based upon independent research. The thesis must be prepared in a way that demonstrates rigorous, independent, empirical or applied research. This option will require that the final product of independent research is prepared in a way that demonstrates that the student has acquired a high level analytical ability. The research must exhibit substantive depth, logical organization, high level of creativity, and clarity of ideas. A faculty committee guides the student's work and evaluates the thesis. Students choosing this track must enroll in the thesis course for a total of 6-9 hours, 3 of which can be substituted for by the internship class. The thesis course receive grade of satisfactory or unsatisfactory only. Grades are assigned only after the defense of the thesis. A successful defense and submission of the thesis requires the supervising member of faculty to assign a satisfactory grade for the thesis course.

INTERNSHIP

Students electing the nonthesis option are required to submit a final report on an investigation conducted while completing the internship or a project report assigned by the faculty advisor. Placements of internships will be sought with various public/private transportation agencies and firms. Students choosing this track must enroll in the 3-hour internship class.

CURRICULUM SUMMARY
Master of Science in Transportation Planning and Management

Total Credits Required Thesis: 39 Hours

| Core Courses (15 SCH) | Specialization (15-21 SCH) | Thesis (9 SCH) |
|----------------------------------|----------------------------|-----------------------|
| | Electives/Concentrations | |
| | Planning and Policy | |
| Maritime Management and Security | TMGT 811 (3) | |
| | TMGT 820 (3) | |
| TMGT 810 (3) | TMGT 825 (3) | |
| TMGT 811 (3) | TMGT 840 (3) | |
| | TMGT 842 (3) | |
| TMGT 815 (3) | TMGT 845 (3) | |
| TMGT 823 (3) | TMGT 850 (3) | |
| TMGT 826 (3) | TMGT 855 (3) | Integrative Component |
| Other Concentrations | TMGT 862 (3) | TMGT 895 (1-3) |
| TMGT 810 (3) | TMGT 865 (3) | TMGT 899 (1-6) |
| TMGT 812 (3) | TMGT 870 (3) | |
| TMGT 815 (3) | TMGT 880 (3) | |
| TMGT 823 (3) | TMGT 882 (3) | |
| TMGT 830 (3) | TMGT 885 (3) | |
| | TMGT 890 (3) | |
| | TMGT 818 (3) | |
| | Systems and Technology | |
| | TMGT 811 (3) | |
| | TMGT 825 (3) | |
| | TMGT 840 (3) | |
| | TMGT 842 (3) | |
| | TMGT 845 (3) | |
| | TMGT 846 (3) | |
| | TMGT 850 (3) | |
| | TMGT 855 (3) | |
| | TMGT 862 (3) | |
| | TMGT 865 (3) | |
| | TMGT 880 (3) | |
| | TMGT 882 (3) | |
| | TMGT 885 (3) | |
| | TMGT 890 (3) | |
| | TMGT 818 (3) | |
| | Logistics and Management | |
| | TMGT 811 (3) | |
| | TMGT 820 (3) | |
| | TMGT 825 (3) | |
| | TMGT 826 (3) | |
| | TMGT 842 (3) | |
| | TMGT 845 (3) | |
| | TMGT 850 (3) | |
| | TMGT 860 (3) | |
| | TMGT 865 (3) | |
| | TMGT 870 (3) | |
| | TMGT 875 (3) | |
| | TMGT 880 (3) | |
| | TMGT 882 (3) | |
| | TMGT 885 (3) | |
| | TMGT 890 (3) | |
| | TMGT 818 (3) | |
| | Maritime Management and | |

| | | |
|--|-------------------|--|
| | Security | |
| | TMGT 820 (3) | |
| | TMGT 825 (3) | |
| | TMGT 830 (3) | |
| | TMGT 842 (3) | |
| | TMGT 850 (3) | |
| | TMGT 866 (3) | |
| | TMGT 867 (3) | |
| | TMGT 868 (3) | |
| | TMGT 869 (3) | |
| | TMGT 870 (3) | |
| | TMGT 875 (3) | |
| | TMGT 871 (3) | |
| | TMGT 872 (3) | |
| | TMGT 880 (3) | |
| | TMGT 882 (3) | |
| | TMGT 885 (3) | |
| | TMGT 890 (3) | |
| | TMGT 818 (3) | |
| | Homeland Security | |
| | TMGT 820 (3) | |
| | TMGT 825 (3) | |
| | TMGT 870 (3) | |
| | TMGT 880(3) | |
| | TMGT 882 (3) | |
| | TMGT 890 (3) | |
| | TMGT 818 (3) | |
| | AJ 614 (3) | |
| | HSM 650 (3) | |
| | HSM 655 (3) | |

Course requirements: Total Semester Credit Hours required: 39

- **Core Curriculum: 15 SCH**
- **Thesis Option**
 - Electives 15-18 SCH
 - Thesis/Internship - 6-9 SCH
- **Non-thesis Option**
 - Electives 21 SCH
 - Internship - 3 SCH

COURSE DESCRIPTIONS

TMGT 810 Fundamentals of Transportation (3)

This course presents an introduction to the organizational, economic, social, and environmental aspects of transportation; historical development and characteristics of various modes of travel, including rail, highway, air, pipeline and water transportation; comparative analysis of domestic and international systems; and administration of public transportation by providers, carriers and government.

TNGT 811 Fundamentals of Shipping (3)

This course is designed to provide graduate students with nonmaritime backgrounds an overview of the shipping industry. It presents elements of commercial shipping, shipping terminology, maritime geography, sea transport, cargo vessel types, vessel size groups, the liners, liner conferences, chartering, shipping documentation, the bill of lading, multimodal transport, marine insurance and general average.

TMGT 812 Principles of Transportation Design and Engineering (3)

This course presents criteria and parameters for the design and engineering of streets and highways, railroads and transit guideways, land transportation terminals, and air and water transportation facilities. Design considerations include system components, such as human factors, environmental constraints, and operational factors; Intelligent Transportation Systems (ITS), and other emerging technologies.

TMGT 815 Computer Applications in Transportation (3)

This course is an introduction to basic computer software for planning and analysis of transportation operations. Both general purpose and specialized software in such areas as traffic engineering, highway operations, transit operations and transportation planning will be considered. Examples of software to be covered include CORSIM, TRANSYT-7F, INTEGRATION, SYNCHRO, HCS, QRS II, etc.

TMGT 818 Transportation Research Methods (3)

This course is designed to provide graduate students with the foundational knowledge required to conduct transportation related research. It introduces the basics of composing a research question and objectives, determining appropriate methodological applications, linking literature with study objectives and identified methodologies, applying statistics and computer based tools for transportation operation and planning analysis and writing technically for transportation reports.

TMGT 820 Transportation Management and Policy (3)

This course presents elements of the transportation environment; formulation and determinants of national, regional and urban/rural transportation policy; roles of regulation and community attitudes; and other impacts on transportation policy.

TMGT 823 Economics of Transportation (3)

This course presents economic characteristics of selected transportation technologies; capital and operational costs of highway and public transportation modes; financing mechanisms and revenue sources for various modes; economic evaluation of alternative systems; cost effectiveness; micro-economic theoretical tools, investment appraisal, pricing techniques; role of domestic and international shipping in the U.S. economy; economic characteristics of waterborne transportation, including the nature of transport demand and cost functions; economic dimension of transportation service; and transportation market structures and transport pricing theory and practice.

TMGT 825 Marine Transport Systems (3)

This course presents types of ocean transportation and port facilities, role of port authorities in international transportation; domestic waterway operations; international water carriage; and elements and factors involved in international trade and their impact on transportation and marketing.

TMGT 826 Ship Operations and Management (3)

This course presents thorough knowledge of key functions in ship management and responsibilities in each area, i.e. commercial, operational, technical, crewing, bunkers, finance and administration; different types of organizational structure from all functions in-house, partly contracted or fully contracted out. Students are expected to understand thoroughly the structure and essential components of a ship management contract and become aware of standard documents including BIMCO Shipman, FUELCON, Lloyds Open Form 2000.

TMGT 830 Urban Transportation Planning (3)

This course presents perspectives on the context of and approaches to planning for public transportation services; long range versus short range planning; the program development process for transportation systems management (TSM) strategies and the comprehensive planning process; and alternative approaches to planning and citizen participation.

TMGT 840 Quantitative Analysis of Transportation (3)

This course is an introduction to analytic tools for operational and managerial decision making in transportation, including linear programming, dynamic programming, network analysis, queuing analysis and simulation.

TMGT 842 Transportation Project Implementation (3)

Project implementation is a key outcome of the transportation planning and management process. Environmental impact statement, and citizen involvement are critical elements leading to implementation. Students enrolled in this course will learn the federal requirements and environmental process relating to transportation projects, project management strategies and software and learn how to incorporate citizen input into the design and implementation process.

TMGT 845 Transportation Systems Analysis (3)

This course presents the system approach and its application to transportation engineering and planning; the transportation industry as a productive system; the use of Transportation System Management (TSM) strategies; and systems analysis techniques including optimization, evaluation and systems modeling.

TMGT 846 Transportation Infrastructure Management (3)

This course presents an integrated approach to the management of infrastructure systems. Analysis methods are developed recognizing the multidimensional nature of performance of facilities, resource constraints and technological innovations and institutional factors. Emphasis on an integrated approach to the design, construction, operations, maintenance and rehabilitation of facilities is through an understanding of the performance of facilities, approaches to management and available tools and developing technologies.

TMGT 850 Travel Demand Forecasting and Analysis (3)

This course presents travel demand forecasting theories and applications. It presents traditional four-step travel demand forecasting models: trip generation, trip distribution, modal split, and traffic assignment, as well as activity-based travel demand forecasting methods. Computer models to be covered include QRS II, EMME2, TransCad, and TRANSIM.

TMGT 855 Site Traffic Analysis (3)

This course presents the basic theory and methodologies in site traffic analysis, including statistical applications in traffic engineering; volume studies and characteristics; speed, travel time, and delay studies; crash studies; and parking studies. Students will be trained through several field surveys of volume, speed and delay, and are expected to have the basic ability to conduct on-site traffic analysis.

TMGT 860 Transportation Special Lectures (3)

This course invites transportation engineers, planners, and managers from both public and private organizations to give special lectures on various transportation topics.

TMGT 862 Highway Traffic Operations (3)

This course presents factors related to freeway operations and traffic signal operations: macroscopic and microscopic traffic stream characteristics, capacity analysis techniques, shockwave theory, freeway traffic management systems, freeway traffic simulations, and evaluation and optimization of traffic signal timings. Software to be covered in this course includes HCS, INTEGRATION, CORSIM, and TRANSYT-7F.

TMGT 865 Traffic Signals and Signal Control (3)

This course presents the basic elements of traffic signals and signal timings including controllers, cycle length, phase structure, offset, change interval, all-red-interval, and split-phase; signal warrants that are included in the Manual on Uniform Traffic Control Devices (MUTCD); traffic signal timing optimization and evaluation software such as TRANSYT-7F, PASSER, TEAPAC, SYNCHRO, CORSIM, etc.; real-time traffic signal control systems such as SCOOT, SCATS and RT-TRACS; and relations of traffic signal operations with other elements of ITS applications.

TMGT 866 Marketing of Maritime Transportation Services (3)

This course presents the basic knowledge and skills about marketing, planning, and analysis applicable to maritime related service firms, including both ship operators and ship owners. Topics include the assessment of internal vs. external customer needs; quality control; competitive strategies; applications of marketing principles and practices to the maritime industry.

TMGT 867 Marine Transportation System Design and Policy (3)

This course presents a historical review of the interaction between American shipping policy, and the design of Vessels, Fleets, and Port Systems. It will also introduce the effects of market structure on economics and finance; port performance and performance measures; the impact of Cabotage Laws, CDS and ODS subsidies, and fleets of a Planned Economy upon domestic and global trade.

TMGT 868 Maritime Operations and Technology (3)

This course examines the role of technology in the maritime business environment. Topics include the technical knowledge of selected aspects in vessel design and operation and/or related maritime land-based or offshore structures, sub-sea engineering/mining, maritime related research, smart locks, use of Physical Oceanographic Real-Time System (PORTS®), AIS, VTS, VDR, GPS, AVRA in vessel and cargo tracking, safety and accident investigations, economic efficiency, coastal resource protection, litigation, and risk assessment.

TMGT 869 Marine Insurance and Cargo Loss Control (3)

This course presents the theory, techniques, participants and background of risk assessment and management with emphasis given to contemporary issues in marine insurance law. Topics include admiralty salvage claims, general average history and evolution into its present form, marine liability coverage, cause of loss, additional perils, exclusions, warranties, duration of risk, adjustment clauses, operating clauses, civil commotions, war insurance, and project risk management techniques.

TMGT 870 Freight and Logistics Management (3)

This course presents U.S. and international movement of goods, including railroads, trucking, air carriers and ocean transport; coordination between the modes; principles of logistics management.

TMGT 871 Maritime Global Trading System (3)

This course introduces the theory of international waterborne trade. It provides a basis for examining American foreign trade policy, and regional and world trade institutions such as the WTO, ASEAN, the EU, GATT, and NAFTA. Topics include: International trade theory and policy, open-economy macroeconomic policy, tariffs, non-tariff barriers and enhancements, multinational enterprises and foreign direct investment, global competition and integration.

TMGT 872 Maritime Ship and Port Security (3)

This course examines ground-level issues, tasks, and responsibilities managed by the Port Security, Officer, Port Director, Federal and local law enforcement agencies to deal with various levels of Threat Analysis as well as responses by Vessels, Companies, and Terminals to various emergencies such as disasters from fire, explosion, petrochemical releases, or hurricanes that may require evacuations of various scale. It will also examine the role of third party contractors in Vessel and Facility Threat Assessment and countermeasures used as response to Piracy and Terrorism.

TMGT 875 Ports and Waterway (3)

This course presents problems and issues related to ports and waterway transportation.

TMGT 876 Advanced Maritime Law (3)

This course introduces the American legal system and analysis of the public policy behind the law. Fundamental and advanced concepts of maritime law to give the students an understanding of the role and importance of maritime law in inland and ocean shipping transportation. Topics include: nature and sources of the law, jurisdiction, constitutional law, administrative law, torts, contracts, seaman rights, collision, pollution, and salvage.

TMGT 880 ITS Technologies and Applications (3)

This course introduces the basic concepts and applications of the Intelligent Transportation Systems (ITS) technologies. Selected technologies in each category of ITS User Services that are defined in *The National Architecture for ITS* are introduced. Methodologies for evaluating the effectiveness and efficiency of ITS systems will be introduced with an emphasis on the advanced simulation models. The selected deployment examples of ITS systems will be examined to identify the policy, institutional and technological barriers that effect the ITS development and deployment.

TMGT 882 Geographical Information Systems for Transportation (3)

This course will include three parts. The first part will introduce the basic concepts of GIS system, including the definition of GIS, the data structures that support spatial and attribute data, coordinate system, map projections and so on. In the second part, the basic skills of ArcGIS software package will be taught through lectures and laboratory work. The third part will introduce some feature GIS applications in transportation, such as GPS data analysis for deriving travel time information, transit bus stops and routes design, hurricane evacuation route design and monitoring, identifying hot spots of accidents, etc.

TMGT 885 Quantitative Assessment of Transportation Environmental Impact (3)

This course will include five parts. The first part will discuss the overall effects of transportation and related activities on the environment and present the indicators of these impacts. The second part will introduce the environmental laws and regulations in transportation and their roles in the project development process. The third part will focus on the air quality impacts of transportation. The fourth part of

this course will focus on the transportation noise issues. In the last part of this course, the solutions or the traffic management strategies for mitigating the environmental impacts of transportation will be introduced.

TMGT 890 Transportation Seminar (3)

This course provides an opportunity for students and the instructor to discuss recent developments and issues in transportation, i.e., policies, energy and environmental issues, notably implementation of the Clean Air Act Amendments (CAAA); urban air quality and the economic impact of various strategies, and applications of advanced technologies in transportation including the Intelligent Transportation Systems (ITS).

TMGT 892 Problems in Transportation (3)

This course is an individual study of special problems, current and emerging issues in transportation conducted under supervision of a faculty member. Student must complete core curriculum prior to enrolling in this course. Approval of graduate advisor is required.

TMGT 895 Internship (3)

Students enrolled in this course are required to submit a written report of the internship or project experience, detailing the specific tasks performed, contributions and the organizational setting is required.

TMGT 899 Thesis (3)

Students enrolled in this course are required to submit a written research thesis. Thesis must be the product of independent research and must exhibit substantive depth, logical organization, and clarity of presentation. A faculty committee will evaluate the student's progress, and the thesis. A thesis option student needs to enroll three times in this course in order to get the required 9 semester credit hours.

AJ 614 Issues in Terrorism and the Administration of Justice (3)

This course presents an analysis of the impact of terrorism on administration and management of justice agencies. Topics covered include domestic and international terrorism, integrated terrorism information systems, secure confinement, and technological developments. (Prerequisites: AJ 501, 607.)

HSM 650 Border and Transportation Security

This course examines the critical tasks and complex challenges involved in securing the nation's airspace and its land and maritime borders, including efforts to prevent intrusions while facilitating the lawful movement of goods and persons. Border and transportation security issues are examined in terms of their impact on the economy, national security, and public safety, with particular emphasis on the interaction between federal, state and local entities with the military and various private sector industries and organizations.

HSM 655 Critical Infrastructure and Key Resource (CI/KR) Protection

The terrorist attacks on September 11, 2001 and effects of Hurricane Katrina in the summer of 2005, poignantly illustrated to the world just how vulnerable some of our critical infrastructures (CI) and key resources (KR) were to manmade and natural disasters. This course provides the student with a detailed overview of the way in which public and private leaders are addressing critical CI/ KR vulnerabilities that affect our way of life. It will explore and analyze the subsequent National Infrastructure Protection Plan and supporting Sector-Specific Plans to determine if they provide the coordinated approach necessary to set national priorities, goals, and requirements for CI/KR protection. Based on assigned readings of key government documents, independent reports and expert analyses, the student will gain a base of knowledge about the vast scope of effort and activities required to protect the nation's most essential assets. The student will also be able to reiterate the details required to reduce CI/KR vulnerabilities, deter threats, and minimize the consequences of attacks and other natural incidents across the nation.