A Quick Reference to Underutilized Universities Participating in TxDOT's Research Program

January 2012

http://www.txdot.gov/txdot_library/publications/research.htm

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“Underutilized” is defined as active institutions averaging less than 2% of total program awards over the previous 5 years.

Lamar University

Beaumont, Texas

Lamar University's Civil Engineering building

Contact Information

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Research Web Page

http://dept.lamar.edu/researchandsponsoredprograms/index.htm

Areas of Research

- Construction, Planning, Scheduling and Productivity, Design and Analysis
- Environmental Science and Engineering
- Experimental Mechanics, Instrumentation and Measurement
- Geotechnical Engineering, Foundation Design and Analysis, Soil Testing/Evaluation/ Improvement, Numerical Modeling in Geotechnical Engineering, and Constitutive Modeling of Engineering Materials
- Structural Analysis and Composite Materials Such as Properties and Behavior of Reinforced/ Pre-stressed Concrete, Fiber-reinforced Polymer Composites for Civil Structures Application, and Experimental Mechanics
- Water Quality Modeling, Hydraulics and Hydrodynamics, and Water Resources Engineering
- Simulation
- Human Factors and Safety
- Engineering Economy

Labs and Equipment

Hydraulics Lab has 12' plastic/glass-walled Open Channel Flume, 16' boat with motor, surveying level, theodolites, GPS and total stations that provide facilities vital for stream surveying research, equipment available for ryegrass experiments, and survey equipment.

Green Composite Research Center and **Composites Lab** for applied research on fiber-reinforced polymer (FRP) composite materials (analysis, design and manufacturing).

Geotechnical Engineering Laboratory has all standard equipment required for soil classification. It is also equipped with two standard consolidometers, one pneumatic consolidometer, one direct residual shear machine, four soil volume change meters, two unconfined compression testing devices, one high pressure permeameter set, and two tri-axial testing devices. **Lab** has software such as Falg 2D, Geo-Slope, RSS, COM624P, RISA-footing, ProEngineer, Promechanica, Algor, and other in-house finite element computer programs for nonlinear elasto-plastic stress, settlement, and slope stability analyses.

Structures and Materials Laboratory has a reaction floor, adjustable reaction frame, overhead gantry crane, control room and mezzanine. Equipment includes 2 MTS machines, an Instron instrumented drop-weight impact machine, a portable eccentric mass vibrator, and several composite materials fabrication and testing devices.

GIS Lab for statistical analysis and geographical information system mapping, remote sensing.

Other devices include: CAB (Centrifugal Adhesion Balance) for measuring adhesion between liquids and surfaces, X-ray Fluorescence, X-ray diffraction, and thermal analyzer.

Prairie View A&M University

Prairie View, Texas

Campus of Prairie View A&M University
Established in 1876

Contact Information

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Research Web Page

http://www.pvamu.edu/pages/178.asp

Areas of Research

- Pavement Design
- Pavement Management
- Environmental Issues
- Hazardous Materials
- Public Transportation
- Statewide, Regional & Local
- Transportation System Planning
- Geographic Information System (GIS)
- Bridge Design
- Geotechnical Issues
- Hydraulics & Hydrology
- Structures Design & Analysis

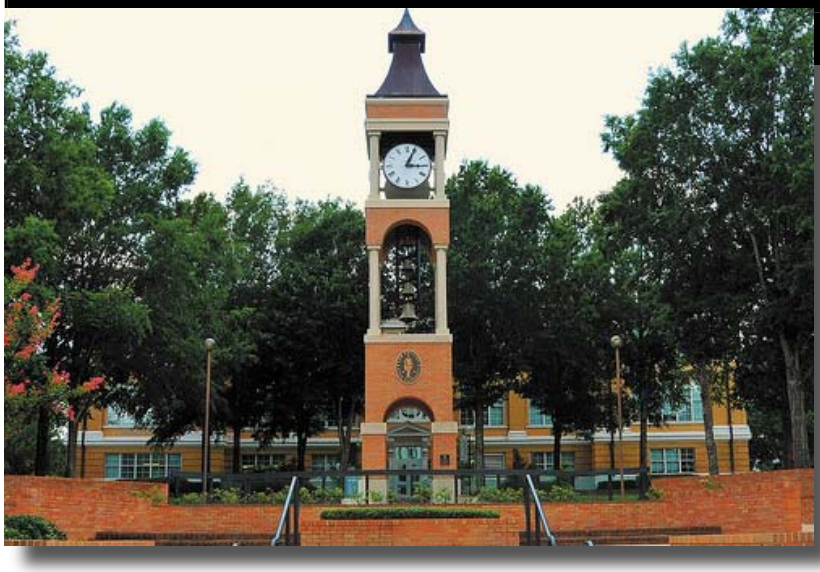
Labs and Equipment

The facilities and equipment available to conduct research in the various focus areas listed consists of several laboratories, namely the structures, environmental, geotechnical, hydraulics, transportation, geographic information systems (GIS), and computer information systems. **The Structures Laboratory** is equipped with an Instron machine which has the capability to perform tension, compression, bending, fatigue and other dynamic and cyclic loading tests. The laboratory also has equipment with testing capabilities for torsion and hardness. **The Environmental Engineering Laboratory** is equipped with water and wastewater analysis tools and sedimentation, filtration, jar test and aerobic digestion apparatus to study various treatment methods. **The Geotechnical Engineering Laboratory** has equipment with the capability to perform triaxial, consolidation, direct shear and unconfined compressive strength tests. Located in the **Hydraulics/Hydrology Engineering Laboratory** is state of the art equipment in fluid mechanics and hydraulic machinery. **The Transportation Engineering, GIS, and Computer Information Systems Laboratory** have state of the art computers loaded with HCM, PASSER, Synchro, Traffix, TravTime, GIS, and other analytical tools.

In addition, Prairie View A&M University Roy G. Perry College of Engineering have other research facilities available in bioengineering, materials, nuclear engineering, environmental impact assessment, graphics and 3-D visualization, artificial intelligence, data-mining, RFID applications, wireless communications, thermal science, lightweight structural materials and processing, nanomaterials, and computer-aided engineering, design and manufacturing.

Sam Houston State University

Huntsville, Texas



Clock Tower at SHSU

Contact Information

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Research Web Page

http://www.shsu.edu/research/

Areas of Research

- Public Works and Management Policy
- Statistics
- Urban and Regional Planning
- Environmental Management
- Policy Analysis and Program Evaluation
- Transportation and the Environment
- Rural Transportation Issues and Analysis
- Environmental and Water Resource Management

Labs and Equipment

Fully equipped **GIS Lab** offering access to several softwares for statistical analysis of data and geographic information system (GIS) mapping as well as a **Remote Sensing** and **Computer Cartography Lab**.

The Texas Research Institute for Environmental Studies and its **Analytical Laboratory** provides quality analytical testing to the federal, state, commercial, industrial, residential, and academic communities.

A variety of testing services are available for ground and surface water, drinking water, wastewater, hazardous waste, soil/sludge, hay, forage and leaf tissue. For more on this facility and labs go to: http://www.shsu.edu/~tries_www/

Stephen F. Austin State University

Nacogdoches, Texas

SFASU Student Center

Contact Information

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Research Web Page

http://www.sfasu.edu/97.asp

Areas of Research

- Remote Sensing, GIS, GPS
- Water Quality; Radioecology of Inland Waters
- Freshwater Ecosystems
- Air Quality
- Soil and Plant Analysis Management
- Geology, Environmental Geochemistry

Labs and Equipment

The Columbia Regional Geospatial Service Center

WET Center Environmental Analysis Laboratory

Soil, Plant & Water Analysis Laboratory

X-ray Diffraction & Clay Preparation Laboratory

Nuclear Magnetic Resonance (NMR) Laboratory

Phytochemistry and Bioassay Laboratory

Anthropology and Archaeology Laboratory

Tarleton State University

Stephenville, Texas

Sculpture beside the Clyde H. Wells Fine Arts Center
Symbolizes "unlocking limits that restrict achievement."

Contact Information

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Research Web Page

http://www.tarleton.edu/research/index.html

Areas of Research

- Water and Soil Quality
- Environmental Issues

Labs and Equipment

Hydrology Lab - Utilizes software including Maple, MultiSim, Matlab, and LabView, as well as Hydrology software including HEC RAS, HEC HMS, and Mod Flow.
http://www.tarleton.edu/COSTWEB/hydrolab/index.html

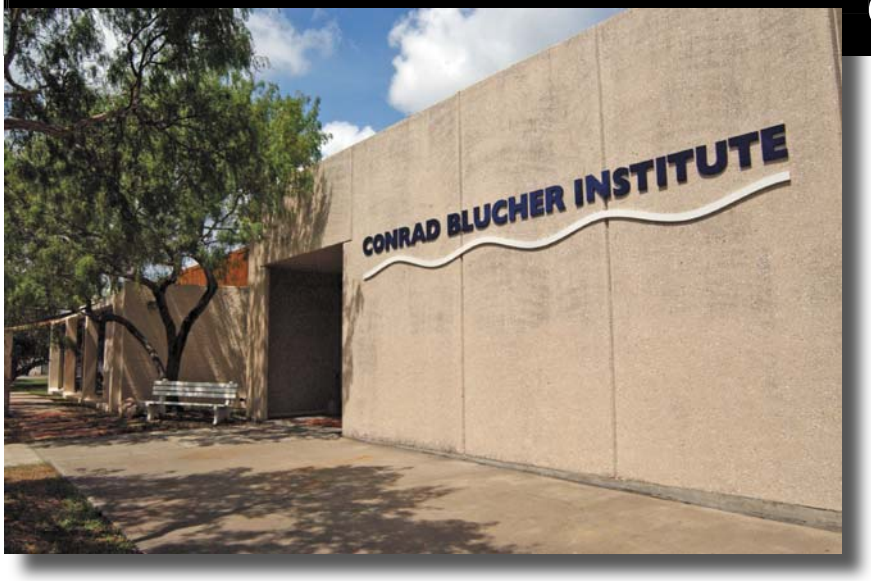
Texas Institute for Applied Environmental Research - In addition to specific detection instrumentation that includes a variety of spectrophotometers, TIAER has an assortment of laboratory support equipment such as ovens, incubators, water baths, balances and sample preparation devices.
http://tiaer.tarleton.edu/

Center for Agribusiness Excellence - Offers planting drills, seeders, fertilization equipment, rollers etc. for establishing field plots both on-station as well as roadside plots. Also available are tractors, tillage equipment, trucks, pick-ups, trailers, greenhouses, growth chambers, and irrigation systems.

http://www.tarleton.edu/cae/

Texas A&M University - Corpus Christi

Corpus Christi, Texas



Conrad Blucher Institute of Surveying and Science

Contact Information

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Research Web Page

http://research.tamucc.edu/researchcenters.php

Areas of Research

- Geospatial Surveying Engineering
- Geographic Information Science
- Geomatics
- Geographic Information Systems
- System Engineering
- Geospatial Computing Systems
- Geospatial Software Engineering
- Professional Land Surveying
- Geodetic Science
- Photogrammetry and Remote Sensing

Labs and Equipment

Conrad Blucher Institute for Surveying and Science (CBI) hosts the Texas Spatial Reference Center (TSRC). TSRC conducts research with federal and local governments to ensure the digital data collected in Texas meets a high quality standard. Projects conducted at CBI with Texas appraisal districts, local city and county governments, the General Land Office, the Texas Natural Resource Information System, and the Texas Water Development Board are completed using extensive land boundary law, technology, and policy experience of the faculty and staff at CBI/TSRC.

Texas A&M University - Kingsville

Kingsville, Texas

Campus at Texas A&M University - Kingsville

Contact Information

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Research Web Page

http://www.tamuk.edu/research/

Areas of Research

- Native Vegetation
- Native Seed Development
- Roadside Restoration and Reclamation
- Environmental Informatics
- Environmental Systems Modeling
- Environmental Sustainability in Semiarid Coastal Areas
- Soil Analysis
- Coastal Erosion
- Bioremediation of Soil and Ground Water
- Water Quality
- Stream Flow Prediction
- Traffic Operations and Safety
- Transportation Infrastructure Construction and Management
- Intelligent Transportation Systems

Labs and Equipment

Caesar Kleberg Wildlife Research Institute

A&M - Kingsville Herbarium

The South Texas Environmental Institute - Access to **environmental laboratories** and various field sites

Texas Southern University

Houston, Texas

Texas Southern University's Science Center

Contact Information

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Research Web Page

http://transportation.tsu.edu/RESEARCH_PROGRAMS.htm

Areas of Research

- Air Quality Analysis, Including Remote Emission Sensing and Modeling
- Artificial Intelligence and Computer Applications in Transportation
- Environmental Policy
- ITS Technologies and Data Processing
- Traffic Congestion Management
- Traffic Control and Management
- Traffic Network Modeling and Simulation
- Transportation Planning and Operations
- Transportation Policy and Management
- Urban Planning

Labs and Equipment

TSU has developed **advanced transportation laboratories** for transportation related education and research. Significant equipment currently installed includes a Full-Motion driver Simulator, Autoscope Mobile Traffic Van, real-time traffic monitoring system, and portable emission measurement system (PEMS).

TSU has an agreement with TxDOT in Houston TranStar by which TSU is able to access the real-time traffic data provided by TranStar.

TSU also owns GPS, traffic counters, and related equipment. This advanced equipment provides a solid infrastructural foundation to support advanced transportation research.

Texas State University - San Marcos

San Marcos, Texas

Located on the banks of the San Marcos River, Texas State opened in 1903.

Contact Information

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Research Web Page

http://www.txstate.edu/research/

Areas of Research

- Construction Materials and Technology
- Asphalt Materials and Technology
- Pavement and Pavement Management
- Structure Materials and Analysis
- Transportation Planning
- Geographic Information System (GIS)
- Nanotechnology
- Environmental Issues and Sustainability

Labs and Equipment

The newly developed **concrete research lab** is fully equipped with state-of-the-art testing equipment including: Concrete Mixing and Processing: Rotary Pan and Drum Concrete Mixers, Environmental Chamber, Curing Room, Automatic Masonry Saw; Fresh Concrete Testing: Concrete Rheometer, Self-Consolidating Concrete Test Set, Maturity Meter, Isothermal Calorimeter; Hardened Concrete Testing**:** Compression Testing Machine, Automatic Freeze-Thaw Chamber, Rapid Chloride Permeability Test, Data Acquisition System, Length Comparators; Materials Testing and Processing: Blaine Fineness Apparatus, Jaw Crusher, Micro-Deval; and Field Testing Equipment: Ultrasonic V-Meter, Rebar Locator/Half Cell Meter, Schmidt Hammer, Core Drill, Inflatable Boat.

The asphalt research lab is equipped with advanced equipment such as: Binder Physical Characterization: Rotational Viscometer, Dynamic Shear Rheometer, Bending Beam Rheometer, Rolling Thin-Film oven, Pressure Aging Vessel; Binder Chemical Characterization: Gel Permeation Chromatograph, X-ray Defraction, Fourier Transform Infrared Spectrometer, High Pressure Liquid Chromatograph, Modulated Differential Scanning Calorimeter; and Asphalt Mix Design and Characterization: Superpave Gyratory Compactor.

In addition, Texas State University – San Marcos has an **Access-Controlled Lab** at the Center for High Performance Systems (CHiPS) with software for conducting statistical data analysis, optimization, and simulation modeling. There is also an **Engineering Informatics Lab** for conducting research in the area of engineering knowledge-based and information systems with the goal of enabling intelligent decision making in distributed design and manufacturing.

University of Houston

Houston, Texas

Cullen Building, University of Houston

Contact Information

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acsherman

Research Web Page

http://www.research. uh.edu/

Areas of Research

- Diesel Testing and Evaluation
- Air Quality
- Superconductivity
- Materials and Nanoscience
- High performance computing
- Environmental Science/Hydrology
- Exploration Geophysics
- Petrology/Petroleum Geology
-

Labs and Equipment

The **Texas Diesel Testing and Research Center** is fully equipped to test fuel and oil additives, engine exhaust retrofits and controls, or other technologies, for an independent evaluation of the effect of the technology on diesel engine emissions and performance.

The **Center for Innovative Grouting Materials and Technology** fosters improved understanding of grouting materials and their applications, grouting materials and technologies used in construction and rehabilitation of civil infrastructure.

The **Structural Research Laboratory** is equipped with a 2,500,000 LBS MTS Testing System, a Universal Element Tester, a Vertical Loading System, Instrumentation and Data Acquisition, a Horizontal Loading System, and a Tinius Olsen Machine.

Other facilities include:

- The Institute for Multi-dimensional Air Quality Studies
- Center for Logistics and Transportation Policy
- Center for Public Policy
- Environmental Institute of Houston
- Real-Time Systems Laboratory

University of North Texas

Denton, Texas

The University of North Texas Campus

Contact Information

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Research Web Page

http://research.unt.edu/

Areas of Research

- Corrosion and Failure Mechanisms of Pavement Materials
- Materials Selection and Characterization
- Structural Health Monitoring Systems and Devices
- Zero-Emission Cryogenic Power Cycles
- Sustainable and Renewable Energy Systems
- Steel Structures
- Construction Management
- Transportation Economics
- Economic Development and Transportation
- Transit System Economics
- Transit Oriented Development

Labs and Equipment

The Center for Economic Development and Research for economic and public policy consulting services.

The Structural Testing Lab at UNT is a 5,400 sq. ft. state-of-the-art structural testing laboratory recently established at the Discovery Park campus of the University of North Texas. The lab is capable of conducting a variety of full scale tests including static and cyclic tests on beam column, shear walls, and trusses. Major equipment includes a 16 ft x 12 ft structural reaction frame, a 60 ft x 22 ft truss testing frame, a 20 kip Instron universal testing machine, and a number of hydraulic cylinders with capacity ranges from 5 kips to 50 kips. Besides the structural testing lab researchers also have access to a fully equipped machine shop where the testing fixtures can be fabricated.

The Polymer Mechanical and Rheology Laboratory at UNT is in the Department of Materials Science and Engineering at UNT, which occupies ~25,000 ft^2 of the UNT Discovery Park. Equipment is available to conduct a range of tests including: mechanical analysis of fibers, resins and composites; field responsive rheology and thermal analysis; manufacturing and processing products from experimental composites; and flammability testing.

University of Texas at Arlington

Arlington, Texas

Civil Engineering Lab at UTA

Research Web Pages:

http://www.uta.edu/ce/research.php
http://www.uta.edu/research/

Areas of Research

- Underground Infrastructure
- Geotechnical Field and Laboratory Investigations
- Geohazards
- Asphalt Materials and Technology
- Pavement Materials and Structures
- Water and Wastewater Treatment
- Air Quality
- Structural Modeling, Design and Rehabilitation
- High Performance Structural Materials
- Transportation Systems Analysis
- Transportation Planning and Safety
- Infrastructure Disaster Mitigation
- Water Resources

Contact Information

University Liaison -
Elvin Franklin
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Labs and Equipment

Construction Lab and CUIRE Facility - includes the **physical testing lab** offering a 30-foot high-bay with a 10-ton bridge crane, load cell area with automatic data acquisition systems, and hydrostatic pressure testing equipment.

Environmental Engineering Research - utilizes equipment such as an Ion Chromatograph, High Performance Liquid Chromatograph, Gas Chromatograph/ Mass Spectrometer, Total Organic Carbon /Total Nitrogen Analyzer, UV-Visible Spectrophotometer, Horiba OBS-1300 On-Board Emission Measurement System, SRI 8610C gas chromatograph with flame ionization detector (FID), OhioLumex RA-915 Light Mercury Analyzer, and International Sensor Technology IQ350-S2 portable gas analyzer. Mobile6 emission estimation and Caline dispersion modeling softwares are also available.

Geotechnical Area - geotechnical equipment available includes soil stabilization laboratory devices, Soil Chemistry Characterization, Resilient Modulus Measurement Devices, Field Instrumentation Devices, Super Sting R8 IP - Earth Resistivity Imaging System, Inclinometer - for slope and wall movement studies, and Sonic Echo NDE 360 and Parallel Seismic Equipment – for unknown foundation depth and drilled shaft integrity testing. http://geotech.uta.edu/lab/equip/index.htm

Materials Lab - capable of Fresh Concrete Testing, Materials Testing and Processing, Asphalt Binder Characterization, Asphalt Mix Design and Accelerated Pavement Testing (summer 2011). Equipment includes a Self-Consolidating Concrete Test Set, Maturity Meter, Vicat and Gilmore apparatus**,** Blaine Fineness Apparatus, Los Angeles Abrasion machine, Micro-Deval; Sand Equivalent testing set, Rotational Viscometer, Dynamic Shear Rheometer, Superpave and Texas Gyratory Compactors, and a Universal Testing Machine and Full-scale Pavement Testing Machine.

The Center for Structural Engineering Research (CSER) **Structural Simulation Laboratory** is the only one of its kind in the State of Texas. **The Civil Engineering Lab (CELB)** (26,000 sq ft) currently has a 3-ft reaction frame with 700 kips capacity for large-to-full scale experiments, hydraulic cylinders up to 650 kips, a 110-kip hydraulic actuator and a 100-kips servo controlled hydraulic material testing machine.

Transportation Research Center - has the **Transportation Laboratory** equipped with computer workstations and software such as ARCVIEW, CORSIM, SYNCHRO, TRAFFEX, TRANSCAD, and VISSIM. Also available are a dedicated instrumented van for field traffic studies (with two fuel sensors, fuel line temperature sensors, and a data acquisition system, and a Horiba On-Board which makes second-by-second measurements of vehicle position with a GPS unit, along with exhaust temperature/pressure and exhaust emissions.

University of Texas at Brownsville

Brownsville, Texas

Campus at The University of Texas at Brownsville

Contact Information

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Areas of Research

- Air Quality Monitoring
- Economic-Impact Studies
- Engineering Studies
- Environmental-Impact Studies
- Environmental Science
- GIS
- Microbiology
- Nanotechnology
- Renewable Energy
- Soil Analysis
- Water Quality Management Planning
- Chemistry and Biochemistry

Research Web Page

http://www.utb.edu/vpaa/csmt/Pages/default.aspx

Labs and Equipment

Four research laboratories: two large upright incubators, five freezers and refrigerators, three chemostats, reagents for axenic microbial growth and selection, nucleic extraction and analysis equipment, spectrophotometers, sterile and chemical hoods, shaker incubators, microplate reader, pH meters, three thermal cyclers, three computers for data acquisition and analysis, imaging equipment, microscopes, electrophoresis equipment.

University of Texas - Pan American

Edinburg, Texas

Campus at UTPA

Contact Information

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Research Web Page

http://rsp.utpa.edu/

Areas of Research

- Wave-structure, Ocean Waves, Currents
- Sub-Tropical Environments
- Ecology, Conservation
- Public Policy and Urban Issues
- Rail Systems
- Traffic Patterns Assessment
- Design, Computer Aided Manufacturing, Automation
- Software Engineering, System Modeling
- Thermodynamics, Refrigeration, Heat Transfer
- Diffusion, Molecules, Polymers, Polymer Particles
- Geology
- Structural and Geotechnical Engineering

Labs and Equipment

College of Science and Engineering:
The Center for Subtropical Studies is a multidisciplinary research component of the College of Science and Engineering at The University of Texas-Pan American (UTPA). The member scientists have a common interest in subtropical environments from a variety of viewpoints. Because of the location of UTPA, a focus of research interest is the Lower Rio Grande Valley with its myriad of attributes and issues.

College of Social & Behavioral Sciences:
The Center for Survey Research at the University of Texas - Pan American delivers information and expertise to decision makers, scholars, community leaders and citizens as they seek to forge solutions to urban problems and deal with issues of public policy. The overall goal of the Center is to provide decision makers and scholars with the best possible information to forge solutions to the problems they confront. Toward that goal, the Center can provide research and technical assistance to governmental and nonprofit organizations in Texas.

University of Texas at San Antonio

San Antonio, Texas

Biotechnology, Sciences, and Engineering Building

Contact Information

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Research Web Pages

http://vpr.utsa.edu/index.php

http://comal.it.utsa.edu/profilesystem/browseprofiles.php?view=2

Areas of Research

- Environmental Engineering (Water Quality and Contaminant Transport Modeling)
- Geotechnical Engineering
- Structural Engineering
- Hydrologic Analysis and Modeling
- Transportation Infrastructure (Bridge and Pavement) Management
- Pavement Material Characterization and Mechanics
- Transportation Planning
- Demographic Planning
- Energy Related Research

Labs and Equipment

Since 2006, the Civil and Environmental Engineering Department has invested over $1.6 million in equipping the laboratories housed in the new Biotechnology, Sciences and Engineering (BSE) building, as well as re-equipping the laboratories located in the Engineering Building (EB). Laboratories in the new BSE building include an **environmental lab** with analytical devices exceeding EPA detection requirements, a sterile **bioenvironmental laboratory** and **a geomaterials laboratory** with full *Superpave* asphalt concrete capabilities. The latter is accredited by AASHTO to meet R18 standards. Laboratory improvements in EB include a refurbished structural dynamics testing system and a new weather sensing system (radar and workstations). The UTSA College of Engineering has state-of-the-art **computer laboratories** supporting civil, mechanical and electrical engineering research. In addition, CEE has acquired a new mutli-processor workstation for fluid mechanics computations. The UTSA Statistical Consulting Center provides: Power and sample-size calculations, Data management, Data analysis, Interpretation of and reporting results, Creation of graphs and tables, and Statistical programming.

University of Texas at Tyler

Tyler, Texas

UT Tyler's Civil Engineering Building

Contact Information

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Research Web Page

http://research.uttyler.edu/

Areas of Research

- Transportation Network Modeling and Optimization
- Transportation Planning
- Traffic Operations and Simulation
- Operations Research
- Statistical Data Analysis
- Equipment Replacement Optimization
- Structural Design Systems
- Hydrology
- Environmental
- Geotechnical Design
- Construction Management
- Surveying

Labs and Equipment

The Civil Engineering Department has a dedicated **transportation lab** currently equipped with 22 powerful computers with transportation systems software including HCS+-T7F, Synchro, CORSIM, Passer-V, VISSIM/VISUM, IDAS, TransCAD, DynaSmart, and GIS, as well as several advanced optimization and statistical analysis software suites such as CPLEX, MATLAB, SAS, and SPSS. Other software available in the **labs for programming** and software development purposes include Microsoft Office, Microsoft Visual Studio 2008, Microsoft .NET Framework, Java, and ARCGIS. Also available for the use of research is a high-performance computer cluster which can generate a throughput of over 9 teraflops per second.

West Texas A&M University

Canyon, Texas

WTAMU Campus

Contact Information

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Research Web Pages

http://www.wtamu.edu/academics/killgore-research-center.aspx

http://www.wtamu.edu/academics/research-labs.aspx

Areas of Research

- Rural Transportation Economics and Planning
- Bridge Construction Design and Engineering
- Environmental Transportation
- Roadside Vegetation Design
- Right-of-Way Analysis

Labs and Equipment

The Engineering Computer Lab has engineering software such as ANSYS, MATLAB, FLUENT, MIDAS CIVIL.

The Engineering Building, renovated in 2001, has over 10,000 sq. ft. of space for offices, a state-of-the-art **computer laboratory** (with video instructional capability), a 32 student video-equipped lecture room, **a heat transfer/fluid dynamics laboratory**, and a **mechanics and materials laboratory.**

Other lab equipment includes: hydrostatics bench, thermoconduction trainer, 6-pass heat exchanger, fluid flow demonstration unit, Rockwell hardness testing unit, Macromet system for metallurgical samples, Nikon metallurgical microscope with digital camera, Image analysis system, tension tester, hot-wire anemometers, extensometers and deflection gages, structures test module, fatigue testing unit, CNC milling machine, CNC lathe, **electronics lab** with circuit boards and oscilliscopes, machine shop with mill, lathe, drill press, welding machines.

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