# Technical Sessions

## Tuesday 9:00am – 10:30am MDT

**Session 1A: Intelligent Transportation Systems (ITS)**
- **Moderator:** TBA
- **Location:** TBA

As transportation agencies are asked to maximize the benefits of infrastructure investments, they are seeking more intelligent, cost effective solutions. This session will present Tran-SET research and analysis that covers: (1) energy harvesting mechanisms, (2) harvesting energy from pavements, (3) smart weigh-in-motion technology, and (4) thermoelectric technology in pavements.

### Experimental Study of Rotational Mechanism in Energy Harvesting in Transportation
- **Mohammadreza Gholikhani** – University of Texas at San Antonio
- **Seyed Amid Tahami** – University of Texas at San Antonio
- **Seyed Shirazi** – University of Texas at San Antonio
- **Gamal Mabrouk** – University of Texas at San Antonio
- **Samer Dessouky** – University of Texas at San Antonio

### Innovative Linear Electromagnetic Energy Harvesting Technology in Roadways
- **Mohammadreza Gholikhani** – University of Texas at San Antonio
- **Seyed Amid Tahami** – University of Texas at San Antonio
- **Mohammadreza Khalili** – University of Texas at San Antonio
- **Beheshti Shirazi** – University of Texas at San Antonio
- **Samer Dessouky** – University of Texas at San Antonio

### Autonomous Vehicle Communication Strategies Modeled in Virtual Reality
- **Nick Ferenchak** – University of New Mexico

### Application of Thermoelectric Technology in Sustainable Pavement Structures
- **Seyed Amid Tahami** – University of Texas at San Antonio
- **Mohammadreza Gholikhani** – University of Texas at San Antonio
- **Reza Khalili** – University of Texas at San Antonio
- **Samer Dessouky** – University of Texas at San Antonio

## Session 1B: Pavements

- **Moderator:** TBA
- **Location:** TBA

“Preserving the existing transportation system” is one of the four major research themes of Tran-SET. To adequately preserve transportation infrastructure, it is vital to evaluate the current condition and to properly monitor the system. This provides the necessary data to provide cost saving maintenance strategies. This session presents a variety of novel approaches to manage, evaluate, and enhance the structural capacity of pavements in the region.

### Optimal Application Timing and Cost Effectiveness of Crack Sealing in Asphalt Concrete Overlays in Louisiana
- **Momen R. Mousa** – Louisiana State University
- **Mostafa A. Elseifi** – Louisiana State University

### Effects of Discontinuities on Temperature Differentials in Asphalt Concrete Overlay and Reflective Cracking Potential
- **Nirmal Dhakal** – Louisiana State University
- **Mostafa A. Elseifi** – Louisiana State University

### Prediction of Field Performance of Asphalt Concrete Overlays in Louisiana Using a Tree-Based Algorithm
- **Momen R. Mousa** – Louisiana State University
- **Mostafa A. Elseifi** – Louisiana State University

### Reflective Crack Mitigation Using Thin Layer of ECC as an Interlayer System
- **Adway Das** – University of Louisiana at Lafayette
- **Sharat** – University of Louisiana at Lafayette
- **Qian Zhang** – Florida State University
- **Mohammad J. Khattak** – University of Louisiana at Lafayette
### TechnicalSessions

**Tuesday 10:30am – 12:00pm MDT**

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This session further explores Tran-SET’s research theme of Preserving the Existing Transportation System by showcasing projects involving inspection techniques, health monitoring systems, and novel materials/techniques to improve resiliency. Specifically, this session presents research that covers: (1) wireless sensors for structural monitoring, (2) applying augmented reality to wireless structural monitoring, (3) structural health monitoring using shape memory alloys, and (4) aerial vehicles to measure deflection.

**Wireless Smart Sensors for Structural Monitoring of Sandia Peak Tramway**
Xinxing Yuan – University of New Mexico  
Zeyu Wu – University of New Mexico  
Rafael Cardona Huerta – University of New Mexico  
Fernando Moreu – University of New Mexico

**The Application of Augmented Reality in Cost-Effective Wireless Structural Monitoring**
Marlon Aguero – University of New Mexico  
Fernando Moreu – University of New Mexico

**Structural Health Monitoring of Next Generation Transportation Structures Using Fe-SMAs**
H. Oczan – Texas A&M University  
J. Zamarripa – Texas A&M University  
J. E. Schaffer – Fort Wayne Metals Research Products Corporation  
I. Karaman – Texas A&M University

**Requirements of Using Aerial Vehicles in Field Experiments to Find Displacement**
Roya Nasimi – University of New Mexico  
Nicolas Cobo – University of Puerto Rico  
Jorshua A. Diaz Rosa – Ana G. Mendez University at Gurabo  
James Woodal – University of New Mexico  
Su Zhang – University of New Mexico  
Fernando Moreu – University of New Mexico

In Region 6, many geotechnical issues are affecting transportation infrastructure: from clay soils, marshlands, to coastal zones and extreme weather events. This session presents on a broad range of geotechnical-related topics relevant to the South-Central States: (1) soil stabilization using recycled glass, (2) soil stabilization using RCA geopolymer in pavement, (3) a suction model for subgrade soil, (4) LiDAR detection of sinkholes and (5) slope stability analysis.

**Stabilization of Expansive Soils Using Recycled Glass**
Hakan Yasarer – University of Mississippi  
Tenant Duckworth – University of Mississippi  
Amanda Gurley – Mississippi Department of Environmental Quality

**Stabilizing Sandy Silt Soil With Fly-Ash Based RCA Geopolymer in Pavement**
Dani Odion – University of Louisiana at Lafayette  
Mohammad J. Khattak – University of Louisiana at Lafayette

**A Mechanistic-Empirical Model to Predict Suction Profile in Subgrade Soil**
Amir Hossein Javid – Oklahoma State University  
Rifat Bulut – Oklahoma State University

**Sinkhole Detection and Mapping Using Airborne LiDAR – A Practical Workflow**
Su Zhang – University of New Mexico  
Susan Bogus Halter – University of New Mexico  
Shirley Baros – University of New Mexico  
Paul R. H. Neville – University of New Mexico

**Comprehensive Slope Stability Analysis of a Failed Roadway Embankment**
Omar Ulloa – Louisiana State University  
Surya Sarat Chandra Congress – Texas A&M University  
Gang Lei – University of Texas at Arlington  
Xinbao Yu – University of Texas at Arlington  
Navid Jafari – Louisiana State University  
Anand Puppala – Texas A&M University
Session 3A: Structural
Moderator: TBA
Location TBA

This session presents another collection of structural research topics that include: (1) vulnerability of coastal bridges to hydrodynamic conditions, (2) geometric optimization of high mast illumination poles, (3) human bridge interaction, and (4) structural optimization of wind-excited high-rise buildings.

Structural Vulnerability of Coastal Bridges Under a Variety of Hydrodynamic Conditions
Arsalan Majlesi – University of Texas at San Antonio
Reza Nasouri – University of Texas at San Antonio
Adnan Shahriar – University of Texas at San Antonio
Arturo Montoya – University of Texas at San Antonio
Adolfo Matamoros – University of Texas at San Antonio

Optimizing the Geometric Configuration and Manufacturing Process of High Mast Illumination Poles
Reza Nasouri – University of Texas at San Antonio
Arturo Montoya – University of Texas at San Antonio
Adolfo Matamoros – University of Texas at San Antonio

Human Bridge Interaction
Selene Diaz – University of New Mexico
Fernando Moreu – University of New Mexico

Time Machine Measure (TMM): Augmented Reality (AR) Technology for Emergency Response and Rescue (ERR)
Jiaqi Xu – University of New Mexico
Fernando Moreu – University of New Mexico

On the Generation of Periodic Wave using Lagrange-Plus Remap Finite Element Method for Evaluating the Vulnerability of Coastal Bridges to Extreme Weather Events
Adnan Shahriar – University of Texas at San Antonio
Arsalan Majlesi - University of Texas at San Antonio
Reza Nasouri - University of Texas at San Antonio
Arturo Montoya - University of Texas at San Antonio
Adolfo Matamoros - University of Texas at San Antonio
Firat Testik - University of Texas at San Antonio

Session 3B: Asphalt Concrete Materials
Moderator: TBA
Location TBA

One of the four major research themes of Tran-SET is “Enhancing the Durability and Service Life of Infrastructure.” This session explores this theme by applying cutting-edge technologies to asphalt concrete materials. This session includes presentations on: (1) self-healing polyurethane pre-polymer modified asphalt mixtures, (2) FTIR analysis of asphalt binders, (3) a nanoscale study on binder properties after aging, and (4) using the Texas overlay tester to study reflective cracking susceptibility.

Laboratory Investigation of Self-Healing Polyurethane Pre-Polymer Modified Asphalt Mixtures
Sharareh Shirzad – Louisiana State University
Marwa Hassan – Louisiana State University
Louay N. Mohammad – Louisiana State University
Sreelatha S. Balamurugan – Louisiana State University

Fourier Transformation Infrared Spectroscopic (FTIR) Analysis on Modified Asphalt Binders
Mohammad Nazmul Hassan – Arkansas State University
Zahid Hossain – Arkansas State University

Nanoscale Study of the Influence of Short-Term and Long-Term Aging on Asphalt Binder’s Properties
Sumon Roy – Arkansas State University
Zahid Hossain – Arkansas State University

The Effectiveness of Using the Overlay Tester Setup to Evaluate the Performance of Asphalt Mixtures Against Reflective Cracking
Ipshit I. Idris – Louisiana State University
Husam Sadek – Louisiana State University
Marwa Hassan – Louisiana State University
Charles Berryman – Louisiana State University
Mohammad I. Hossain – Bradley University
Session 4A: Portland Cement Concrete Materials  
Moderator: TBA  
Location TBA

This session further explores Tran-SET’s research theme of “Enhancing the Durability and Service Life of Infrastructure.” It presents the application of novel materials to improve durability of concrete materials and structures, while using locally available products/by-products; effectively constituting these high-performing materials more cost-effective and implementable.

Development of Engineered Cementitious Composite with Bagasse Ash as Sand Replacement  
Hassan Noorvand – Louisiana State University  
Gabriel Arce – Louisiana State University  
Marwa Hassan – Louisiana State University

Evaluation Raw Bagasse Ash as Sand Replacement for the Production of Engineered Cementitious Composites (ECC)  
Sujata Subedi – Louisiana State University  
Gabriel Arce Amador – Louisiana State University  
Hassan Noorvand – Louisiana State University  
Marwa Hassan – Louisiana State University  
Louay N. Mohammad – Louisiana State University

Advantageous Construction Techniques for ECC Overlays  
Michele Anderson – University of New Mexico  
Susan M. Bogus – University of New Mexico  
Gabriel Arce – Louisiana State University  
Ricardo Hungria – Louisiana State University  
Marwa Hassan – Louisiana State University

Interface Characterization of a Jointless Engineered Cementitious Composite Ultrathin White Topping (ECC-UTW) Under Accelerated Loading  
Ricardo Hungria – Louisiana State University  
Gabriel Arce – Louisiana State University  
Marwa Hassan – Louisiana State University  
Tyson Rupnow – Louisiana State University  
Moinul Mahdi – Louisiana State University  
Mohammad Loay – Louisiana State University

Session 4B: Asphalt Concrete Materials  
Moderator: TBA  
Location TBA

This session presents another collection of asphalt concrete materials topics that include: (1) aggregate drying in asphalt plants, (2) use of reclaimed asphalt pavement materials, (3) compatibility of asphalt binders and aggregates, (4) emulsion residue recovery methods, and (5) elastic recovery tests for modified asphalt binders.

How Hot is Too Hot for Drying Moist Virgin Aggregate in Asphalt Concrete Plant?  
Mohammad Hossain – Bradley University

The Use of Reclaimed Asphalt Pavement Materials and Warm-Mix Asphalt Mixtures in the South-Central States: Challenges and Limitations  
Farah Zaremotekhases – Louisiana State University  
Husam Sadek – Louisiana State University  
Marwa Hassan – Louisiana State University  
Charles Berryman – Louisiana State University  
Mohammad I. Hossain – Bradley University

Evaluation of Compatibility of the Asphalt Binders and Aggregates in Asphalt Pavements  
Tandra Bagchi – Arkansas State University  
Zahid Hossain – Arkansas State University

A Comparative Study Between Emulsion Residue Recovery Methods Based on Polymer Degradation  
Roksana Hossain – Louisiana Tech University  
Mohammad Readul Islam – New York State Department of Transportation  
Nazimuddin M. Wasiuddin – Louisiana Tech University

Evaluation of Conventional Elastic Recovery Tests for Modified Binders  
M. M. Tariq Morshed – Arkansas State University  
Zahid Hossain – Arkansas State University
## Technical Sessions

**Wednesday 9:00am – 10:30am MDT**

### Session 5

#### Session 5A: Portland Cement Concrete Materials
Moderator: TBA  
Location TBA

As a follow-up to Session 4A, this session further explores Tran-SET’s research theme of “Enhancing the Durability and Service Life of Infrastructure.” It investigates the application of novel materials to improve durability of concrete materials and structures, while using locally available products/by-products; effectively constituting these high-performing materials more cost-effective and implementable.

**Hydration and Strength Development in Blended Class F and Class C Fly Ash Systems**
Fredrico Aguayo – Texas State University  
Anthony Torres – Texas State University  
Ikechukwu Okechi – Texas State University  
Teague Hartigan – Texas State University

**Ultra-High Performance Shear Keys in Concrete Bridge Superstructures**
Jordan Varbel – New Mexico State University  
Elsy Flores – New Mexico State University  
William Toledo – New Mexico State University  
Craig Newtson – New Mexico State University  
Brad Weldon – New Mexico State University

**Alkali-Silica Reactivity of Ultra-High Strength Foundry Sand Concrete**
Anthony Torres – Texas State University  
Fredrico Aguayo – Texas State University  
Ikechukwu Okechi – Texas State University  
Olvin J. Funez – Texas State University

**Ultra-High Performance Concrete Overlays on Concrete Bridge Decks**
William Toledo – New Mexico State University  
Craig Newtson – New Mexico State University  
Brad Weldon – New Mexico State University

**Scanning Tour of Polyester Polymer Concrete Overlays on Bridge Decks**
Robert J. Stevens – Brigham Young University  
W. Spencer Guthrie – Brigham Young University

### Session 5B: Pavements
Moderator: TBA  
Location TBA

In conjunction with Session 1B, this session presents a variety of pavement research topics that include:
1. effects of pavement type on fuel consumption,
2. shakedown analysis of flexible pavements, and
3. the effects of natural disasters on road networks.

**Evaluation of the Effects of Pavement Types on Fuel Consumption Excess Using Finite Element Modeling**
Nirmal Dhakal – Louisiana State University  
Mostafa A. Elseifi – Louisiana State University

**Shakedown Analysis of Flexible Pavement Considering Dynamic Effects of Traffic Loading**
Lin Li – Louisiana State University  
Zhiming Zhang – Louisiana State University  
Shengli Chen – Louisiana State University  
Chao Sun – Louisiana State University

**A Framework for the Estimation of the Impact of Natural Disasters on Road and Street Networks**
Mohsen Talebsafa – University of Texas at Arlington  
Stefan A. Romanoschi – University of Texas at Arlington  
Ana Maria Coca – University of Texas at Arlington  
Constantin Popescu – University of Texas at Arlington
As a follow-up to Sessions 4A and 5A, this session presents a collection of research topics related to novel concrete materials. Specific topics to be presented include: (1) using rice husk ash in flowable fill, (5) cellular concrete technologies for fill applications, (3) roller compacted geopolymer concrete, and (4) metakaolin-based geopolymer binders.

**Application of Rice-Husk Ash (RHA) in Flowable Fill Concrete**  
Kazi Tamzidul Islam – Arkansas State University  
Zahid Hossain – Arkansas State University

**An Introduction to Cellular Concrete and Advanced Engineered Foam Technologies**  
Nico Sutmoller – Aerix Industries

**Feasibility of Roller Compacted Geopolymer Concrete Containing Recycle Concrete Aggregate**  
Sk Syfur Rahman – University of Louisiana at Lafayette  
Mohammad J. Khattak – University of Louisiana at Lafayette

**Feasibility Study of Metakaolin-Based Geopolymer as Binder for Construction Mortar**  
Oscar Huang – Texas A&M University  
Nathaniel Lies – Texas A&M University  
Miladin Radovic – Texas A&M University

This session presents a variety of traffic related research topics that cover multiple modes of transportation and life cost analyses. Specific research topics include: (1) effects of pavement type on fuel consumption, (2) shakedown analysis of flexible pavements, and (3) the effects of natural disasters on road networks.

**Retrofit of Corroded Corrugated Metal Culverts Using GFRP**  
Rahulreddy Chennareddy – University of New Mexico  
Susan Bogus Halter – University of New Mexico  
Mahmoud M. Reda Taha – University of New Mexico

**Life Cycle Cost Estimation of Corrugated Metal Pipes in Arkansas**  
Md Ariful Hasan – Arkansas State University  
Zahid Hossain – Arkansas State University

**Sensitivity Analysis of Potential Houston-Dallas High-Speed Rail System**  
Jesuina Chipindula – Prairie View A&M University  
Du Hongbo – Prairie View A&M University  
Choe Doeun – Prairie View A&M University  
Raghava Kommalapati – Prairie View A&M University

**ABQ Streets Project: Creating Alternative Residential Street Designs**  
Nick Ferenchak – University of New Mexico  
Greg Rowangould – University of Vermont
**Technical Sessions**

**Wednesday 1:30pm – 3:00pm MDT**

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As a follow-up to Session 1A, this session presents a collection of research topics related to intelligent transportation systems. Specific topics to be presented include: (1) connected and automated vehicle technologies, (2) a wildlife detection system, (3) smart weigh-in-motion technology, (4) a machine learning distracted driving model, and (5) using unmanned aerial vehicles for close range photogrammetry of rock slopes.

**Preparation of Connected and Automated Vehicle (CAV) Technologies in the State of Louisiana**
Christopher Melson – Louisiana State University
Jiaqi Ma – University of Cincinnati

**Enhancing Evaluation of Wildlife Detection Systems**
Nick Ferenchak – University of New Mexico
David Hadwiger – New Mexico Department of Transportation

**Smart Ultra Low Power Weigh-In-Motion System**
Gopal Vishwakarma – University of Texas at San Antonio
Mohammadreza Khalili – University of Texas at San Antonio
Sara Ahmed – University of Texas at San Antonio
A. T. Papagiannakis – University of Texas at San Antonio

**A Machine Learning Distracted Driving Prediction Model**
Samira Ahangari – Morgan State University
Mansoureh Jelhani – Morgan State University
Abdollah Dehzangi – Morgan State University
Payam Asban – Morgan State University

**Evaluation of Rock Slope Stability Using 3-Dimensional Data Analysis**
Surya Sarat Chandra Congress – Texas A&M University
Prince Kumar - Texas A&M University
Aritra Banerjee – University of Texas at Arlington
Sayantan Chakraborty – Texas A&M University
Ujwalkumar D. Patil – University of Guam
Anand J. Puppala – Texas A&M University