

# Technical Sessions

Tuesday 9:00am – 10:30am MDT

Session 1

## Session 1A: Intelligent Transportation Systems (ITS)

Moderator: TBA

Location TBA

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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

Reza Khalili – University of Texas at San Antonio

Samer Dessouky – University of Texas at San Antonio

## Session 1B: Pavements

Moderator: TBA

Location TBA

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“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

# Technical Sessions

Tuesday 10:30am – 12:00pm MDT

Session 2

## Session 2A: Structural

Moderator: TBA

Location TBA

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

## Session 2B: Geotechnical

Moderator: TBA

Location TBA

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

Daniel 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

# Technical Sessions

Tuesday 1:30pm – 3:00pm MDT

## 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

Ipshtit 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

# Technical Sessions

Tuesday 3:30pm – 5:00pm MDT

Session 4

## 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 Transportation

Research Center

### 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 Zaremotekhasas – 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 Newtonson – 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 Newtonson – 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

# Technical Sessions

Wednesday 10:30am – 12:00pm MDT

Session 6

## Session 6A: Concrete Materials

Moderator: TBA

Location TBA

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

## Session 6B: Multimodal Traffic and Life Cycle Costs

Moderator: TBA

Location TBA

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

MdAriful 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

Session 7

## Session 7A: Intelligent Systems (ITS)

Moderator: TBA

Location TBA

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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 Jeihani – 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

Sayantana Chakraborty – Texas A&M University

Ujwalkumar D. Patil – University of Guam

Anand J. Puppala – Texas A&M University

## Session 7B: TBA

Moderator: TBA

Location TBA

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