



# TRAN-SET

April 3-4, 2018 | The Intercontinental Hotel | New Orleans, LA

# Welcome

## Welcome to the Tran-SET Conference at CRC 2018!

On behalf of the organizing committee, I am honored to welcome you to the inaugural Transportation Consortium of South Central States (Tran-SET) Conference held in the lively city of New Orleans, Louisiana.

Tran-SET is a University Transportation Center (UTC) comprising of 11 partnering institutions across Region 6 (AR, LA, NM, OK, and TX), with an aim to *address the accelerated deterioration of our transportation infrastructure through the development, evaluation, and implementation of cutting-edge technologies, novel materials, and innovation construction management processes: from research to implementation*. We believe that our focus on implementation makes us unique and our strong alliances with industry, academic, and government agencies will help us succeed and reach our goals.



The Tran-SET Conference will bring together academics, industry professionals, state DOTs, and other government agencies interested in solving transportation challenges facing Region 6. Attendees will be introduced to Tran-SET's research, education, workforce development, and technology transfer activities. Attendees will also see a variety of technical contributions covering multiple transportation fields, including pavements, asphalt and concrete materials, structures, geotechnical, safety, intelligent transportation systems, and policy and planning. The Tran-SET Conference will host an exhibition showing some of the technologies that have been developed/utilized in our research projects.

Please enjoy the exhibition and the conference! Your presence is an indication that you are committed to making a positive difference, not only to our transportation industry, but also throughout your state and the country. We hope you have a productive meeting and enjoy all that New Orleans has to offer!

Marwa Hassan, Ph.D., PE Civil (VA)  
Director of Tran-SET  
CRC 2018 President

# *Keynote Speaker*

**Dr. Shawn Wilson, State Secretary of the Department of Transportation**



Dr. Shawn Wilson was appointed Secretary of the Louisiana Department of Transportation and Development (DOTD) by Governor John Bel Edwards on January 11, 2016 after more than 10 years of executive service at DOTD.

Secretary Wilson earned a B.A. in Urban and Regional Planning from the University of Louisiana and holds a Master of Public Administration degree as well as a Ph.D. in Public Policy from the Nelson Mandela School of Public Policy and Urban Affairs from Southern University.

Since his appointment, Secretary Wilson has been a tireless advocate for new revenue, maximizing federal dollars available to Louisiana, advancing a balanced and comprehensive transportation policy for Louisiana, and ensuring the department is more collaborative in its work at every level.

Under his leadership, DOTD was successful at securing \$60 million Fastlane Grant in 2016, obligating additional federal dollars on major I-10 widening from I-49 to New Orleans, the Baton Rouge I-10 bottleneck, and this January broke ground on widening I-10 from Highland to LA 73. Most recently, DOTD announced it would be pursuing new innovative funding in the form of GARVEE bonds to fund the widening of I-10 from the Mississippi River Bridge to the 10-12 split, a new I-10 Interchange at Loyola Drive to serve the new Louis Armstrong International Airport terminal under construction, access from I-20 directly to the Barksdale Air Force Base, and that Louisiana will seek to begin its first public-private-partnership on LA 23.

Shawn and his wife, Rocki, reside in Lafayette. Together they have two children, Shawn Denise Arceneaux and Star Scout Joshua Bakari.

# Tran-SET Team

## **CENTER DIRECTOR**

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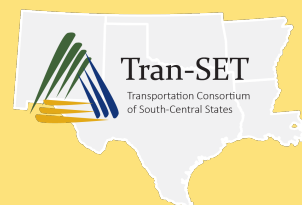
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## **ABOUT TRAN-SET**

The theme of the Center is “Solving Emerging Transportation Resiliency, Sustainability and Economic Challenges through the Use of Innovative Materials and Construction Methods: From Research to Implementation.” The Center’s Mission is to support all phases of research, technology transfer, workforce development, and outreach activities of emerging technologies that can solve transportation challenges in Region 6.

## **ABOUT REGION 6**

The combined Region 6 UTC team represents a collaborative partnership between nine major institutions and two community colleges. This partnership will combine the distinct characteristics and strengths of each institution to deliver a Center with unique capabilities to tackle regional transportation challenges.

*Please visit our website (<http://transet.lsu.edu/>) for additional details and contact information of our members and staff.*

**ABOUT THE  
INTERCONTINENTAL  
HOTEL**

InterContinental New Orleans is located in the heart of New Orleans' Central Business District, where shopping, entertainment, and the city's best restaurants meet. Just steps away from the French Quarter and Warehouse District, InterContinental New Orleans is a symbol of unpretentious luxury and hosts discerning travelers from all over the world..

**ABOUT THE  
STEAMBOAT NATCHEZ**

True to tradition in every detail, boarding the NATCHEZ makes you feel as if you have entered another era. The captain barks his orders through an old-time hand-held megaphone. The calliope trills a melody into the air while the great wheel, 25 tons of white oak, churns the heavy waters of the Mississippi. You soon find yourself slipping into a sense of the old, vast and timeless river.

# *Program at a Glance*

## **TUESDAY, April 3, 2018**

- 8:00am - 5:00pm **Conference Registration**  
*Grand Staircase (2nd Floor)*
- 11:00am - 12:00pm **Student Poster Competition**  
*Frenchman Room II (2nd Floor)*
- 12:00pm - 1:30pm **Lunch**  
*LaSalle Ballroom (3rd Floor)*
- 1:30pm - 4:30pm **Student Poster Competition (cont.)**  
*Frenchman Room II (2nd Floor)*
- 1:30pm - 5:30pm **Tran-SET Business Meeting (Invitation Only)**  
*Frenchman I (2nd Floor)*
- 5:30pm - 6:00pm **Break and Travel to Steamboat Natchez Riverboat Banquet**  
*Transportation will be provided at the entrance of the Intercontinental Hotel at 4:30pm to 5:30pm*
- 6:00pm - 9:00pm **Welcome Reception**  
*Steamboat Natchez Riverboat Cruise (Invitation Only)*

## **WEDNESDAY, April 4, 2018**

- 7:00am - 12:00pm **Conference Registration**  
*Grand Staircase (2nd Floor)*
- 7:00am - 8:00am **Continental Breakfast**  
*Le Salon Pre-Function Area (3rd Floor)*
- 8:00am - 9:00am **Keynote Speaker Presentation**  
*LaSalle Ballroom (3rd Floor)*  
*Remarks by Dr. Charles Berryman – Louisiana State University; Speech by Dr. Shawn Wilson – Louisiana Department of Transportation and Development*
- 9:00am - 9:10am **Break and Travel to Session 1**
- 9:10am - 10:30am **Technical Session 1**  
*Session 1A: Intelligent Transportation Systems – Frenchman I (2nd Floor)*  
*Session 1B: Pavements – Frenchman II (2nd Floor)*

# *Program at a Glance Contd.*

**WEDNESDAY, April 4, 2018**

- 10:30am - 10:40am **Break and Travel to Session 2**
- 10:40am - 12:00pm **Technical Session 2**  
*Session 2A: Policy and Planning – Melopmene (2nd Floor)*  
*Session 2B: Geotechnical – Frenchman II (2nd Floor)*
- 12:00pm - 1:30pm **Lunch**  
*LaSalle Ballroom (3rd Floor)*
- 1:30pm - 1:40pm **Travel to Session 3**
- 1:40pm - 3:20pm **Technical Session 3**  
*Session 3A: Structures – Melopmene (2nd Floor)*  
*Session 3B: Asphalt Materials – Frenchman II (2nd Floor)*
- 3:20pm - 3:30pm **Break and Travel to Session 4**
- 3:30pm - 5:10pm **Technical Session 4**  
*Session 4A: Structures – Melopmene (2nd Floor)*  
*Session 4B: Concrete Materials – Frenchman II (2nd Floor)*
- 5:30pm **Tran-SET Conference concludes. Thanks for joining us!**

## *Student Poster Competition*

**TUESDAY | 11:00am – 12:00pm; 1:30pm - 4:30pm | Frenchman II**

Please join us as Tran-SET-sponsored students present on their research and participate in a poster competition. 17 posters from 7 universities will be judged by a panel – and certificates for first, second, and third prize will be awarded. We are also asking attendees to participate in the competition – by judging and voting for their favorite. A *Fan Favorite* will also be awarded!

# Technical Sessions

WEDNESDAY | 9:10am – 10:30am | Session 1

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

*Moderator: Julius Codjoe | Frenchman I (2nd Floor)*

As transportation agencies are asked to increasingly maximize the benefits of their investments, they are continually exploring more innovative, lower-cost solutions. This session will investigate such solutions for a wide-range of transportation issues: mobility, safety, and emissions. During this session, Tran-SET research and analysis will be presented on: (1) improving operational performance at a common chokepoint in Baton Rouge, LA (Mississippi River Bridge), (2) decreasing crashes at urban intersections in San Antonio, TX, (3) improving overall freight mobility, and (4) decreasing freight emissions.

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### Improving the Transportation System Performance in the Baton Rouge Area, LA, through Supply- and Demand-Oriented Measures for Mitigating Traffic Congestion

*Samir Ahmed – Oklahoma State University  
Osama Osman – Louisiana State University  
Julius Codjoe – Louisiana Transportation Research Center*

### Relationship between Road Network Characteristics and Traffic Safety

*Hatim Sharif, Samer Dessouky – University of Texas at San Antonio*

### Study the Impacts of Freight Consolidation and Truck Sharing on Freight Mobility

*Tieming Liu, Devaraja Radha Krishnan, Chaoyue Zhao – Oklahoma State University*

### Emission Analysis of Diesels Derived from Biomass used for Hybrid Transportation Fleet

*Hongbo Du, Arndreya Howard, Raghava Kommalapati – Prairie View A&M University*

## Session 1B: Pavements

*Moderator: Stefan Romanoschi | Frenchman II (2nd Floor)*

One of the four major research themes of Tran-SET is *Preserving the Existing Transportation System*. In order to adequately preserve the existing transportation system, it is critical to understand the current condition and to properly monitor the system. This provides the necessary data as to provide cost saving maintenance strategies. This session presents a variety of structural detection, evaluation, and health monitoring methods related to pavements.

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### Non-Destruction Detection of Moisture Damage in Pavements Using Ground Penetrating Radar

*Mohammad Bashar, Mostafa Elseifi, Momen Mousa – Louisiana State University  
Zhongjie Zhang – Louisiana Transportation Research Center*

### Evaluation of Comparative Damaging Effects on Flexible Pavements from Multiple Truck Axles

*Stefan Romanoschi, Mohsen Talebsafa, Constantin Popescu – University of Texas at Arlington  
Athanasios T. Papagiannakis, Rajesh Kaphle – University of Texas at San Antonio*

### Simplified Approach for Structural Evaluation of Flexible Pavements at the Network Level

*Mena Souliman, Karthikeyan Loganathan, Mayzan Isied – University of Texas at Tyler  
Stefan Romanoschi – University of Texas at Arlington  
Samer Dessouky – University of Texas at San Antonio*

### Structural Health Monitoring using Magnetic Shape Memory Alloy Cables in Concrete

*Allen Davis, Mirmalid Mirsayar, Emery Sheahan, Darren Hartl – Texas A&M University*

# Technical Sessions Contd.

**WEDNESDAY** | 10:40am – 12:00pm | Session 2

## Session 2A: Policy and Planning

*Moderator: Christopher Melson | Melopmene (2nd Floor)*

As transportation practitioners and researchers, it is important to think of the transportation system holistically when addressing issues; such as the user's perspective, equity, and interaction with system components. This session investigates a variety of user-related issues and potential solutions in Region 6 (AR, LA, NM, OK, and TX), such as: (1) distracted driving in LA, (2) sustainable and equitable practices for financing pedestrian sidewalks in Albuquerque, NM, (3) workforce recruitment, retention, and promotion at transportation agencies, and (4) closure of railroad grade crossings.

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### **Incentive Program for Closure of Grade Crossing in the United States: A State-of-the-Practice**

*Julius Codjoe – Louisiana Transportation Research Center  
Samira Soleimani, Seth Ledet – Louisiana State University*

### **Current Practices for Recruiting and Retaining Qualified Workers at State Transportation Agencies**

*Julia Hernandez, Christofer Harper – Louisiana State University  
Kristal Metro, Susan Bogus Halter – University of New Mexico*

### **Sustainable and Equitable Financing for Pedestrian Infrastructure Maintenance and Reconstruction**

*Alexis Corning-Padilla, Gregory Rowangould – University of New Mexico*

### **Investigating Problem of Distracted Drivers on Louisiana Roadways**

*Xiaoduan Sun, M. Ashifur Rahman, Ming Sun, Yi He – University of Louisiana at Lafayette*

## Session 2B: Geotechnical

*Moderator: Samer Dessouky | Frenchman II (2nd Floor)*

One can imagine the many and wide-ranging geotechnical issues facing transportation infrastructure in Region 6: 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 southeastern United States: (1) investigating various Geopolymer-based compositions for stabilizing base and subgrade foundations using natural and waste materials abundant in Region 6, (2) forming a knowledge base of surface fault locations relating to critical infrastructure in the coastal zone of LA, (3) developing a framework for identifying high-risk locations that may fail through slope stability issues in a changing climate, and (4) evaluating current and emerging in-situ tests methods/devices to inform development of an improved automated in-situ testing device for compacted aggregates.

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### **Development of Field-friendly Mechanical Characterization Method for Compacted Unbound Aggregates**

*Douglas Cortes, Paola Bandini – New Mexico State University*

### **Environmentally-friendly and Sustainable Soil Stabilization for Transportation Infrastructure**

*Rinu Samuel, Aritra Banerjee, Ananda Puppala – University of Texas at Arlington  
Oscar Huang, Miladin Radovic – Texas A&M University*

### **Predication and Rehabilitation of Highway Embankment Slope Failures in a Changing Climate**

*Navid Jafari, Jack Cadigan – Louisiana State University  
Burak Boluk, Tejo Bheemasetti, Anand Puppala – University of Texas at Arlington*

### **Understanding the Influence of Subsurface Geologic Faulting on Transportation Infrastructure, Southeast Louisiana**

*Chris Young, Nancye Dawers – Tulane University  
Elizabeth McDade, David Culpepper – The Culpepper Group, LLC*

# Technical Sessions Contd.

WEDNESDAY | 1:40pm – 3:20pm | Session 3

## Session 3A: Structures

Moderator: Michele Barbato | Melopmene (2nd Floor)

In conjunction with Session 4A, this session further explores Tran-SET's research theme of *Preserving the Existing Transportation System* by showcasing research projects involving inspection techniques, health monitoring systems, and novel materials/techniques to improve resiliency and durability of transportation structures. Specifically, this session presents on: (1) developing cost-effective shape memory alloys with structural health monitoring capabilities, (2) developing a bridge-response model to mitigate risk and improve resiliency to extreme weather events, (3) developing a system to assist engineers in the inspection of bridges using unmanned aerial vehicles, and (4) developing a technique to retrofit corroded metal culverts using glass fiber reinforced polymers (GFRP).

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### **Integrated Health Monitoring and Reinforcement of Transportation Structures with Optimized Low-Cost Multifunctional Braided Cables**

H. Ozcan, J. Ma, I. Karaman – Texas A&M University

### **Coastal Bridges under Hurricane Stresses along the Texas and Louisiana Coast**

Adolfo Matmaros, Firat Testik – University of Texas at San Antonio

### **Design Consideration in the use of Unmanned Aerial Vehicles for the Purpose of Bridge Inspection**

Paul Darby – University of Louisiana at Lafayette

### **Retrofitting Corroded Metal Culverts using GFRP Composites**

Rahulreddy Chennareddy, Susan Bogus Halter, Mahmoud Red Taha – University of New Mexico

### **Multi-Hazard Risk Analysis of Bridges Considering Climate Change**

Omid Khandel, Mohamed Soliman – Oklahoma State University

## Session 3B: Asphalt Materials

Moderator: Zahid Hossain | Frenchman II (2nd Floor)

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* and *novel materials* to asphalt materials. This session presents on: (1) evaluating the feasibility of nanoclays to enhance performance of asphalt binder, (2) developing a test method to characterize modified asphalt binders and quantify degradation due to aging, (3) developing a test protocol to quantify moisture susceptibility for asphalt pavements, and (4) developing an approach to address the aging of asphalt binders and improve performance of the mixture against cracking and rutting.

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### **Use of Nanoclays as Alternatives of Polymers toward Improving Performance of Asphalt Binder**

M.M. Tariq Morshed, Mohammad Nazmul Hassan, Zahid Hossain – Arkansas State University

### **Evaluation of Polymer Degradation Due to Aging in Asphalt Binder and Determination of Polymer Content in Asphalt Emulsion using an Extensional Deformation Test**

Roksana Hossain, Waleed Mohammed Omer, Nazimuddin Wasiuddin – Louisiana Tech University

### **Evaluation of Effects of Moisture on Asphalt Pavements**

Sumon Roy, Zahid Hossain – Arkansas State University

### **Enhancing the Durability and the Service Life of Asphalt Pavements through Innovative Light-induced and Self-Healing Materials**

Sharareh Shirzad, Marwa Hassan, Max Aguirre, Ioan Negulescu, Louay Mohammad – Louisiana State University  
Sam Cooper, Jr. – Louisiana Transportation Research Center

### **Development of Self-healing and Rejuvenating Mechanism for Asphalt Mixtures Containing Recycled Materials**

Max Aguirre, Marwa Hassan, Sharareh Shirzad, Ioan Negulescu, Louay Mohammad – Louisiana State University  
Sam Cooper, Jr. – Louisiana Transportation Research Center

# Technical Sessions Contd.

**WEDNESDAY** | 3:30pm – 5:10pm | Session 4

## Session 4A: Structures

Moderator: Craig Newtonson | *Melopmene (2nd Floor)*

In conjunction with Session 3A, this session further explores Tran-SET's research theme of *Preserving the Existing Transportation System* by showcasing research projects involving various health monitoring systems and novel materials/techniques to improve durability of transportation structures. Specifically, this session presents on: (1) developing and investigating ultra-high performance fiber-reinforced concrete (UHP-FRC) for fast, sustainable, and conventional concrete repair through a series of laboratory tests, (2) developing cost-effective technologies such as drones and augmented reality tools for structural health monitoring, and (3) developing and evaluating a thermoelectric generator prototype, that generates electricity from the temperature gradient of pavements and its sublayers.

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### Use Ultra-High Performance Fiber-Reinforced Concrete (UHP-FRC) for Fast and Sustainable Repair of Concrete

Ashish Karmacharya, Shih-Ho Chao – University of Texas at Arlington

### Deterministic and Probabilistic Modeling Framework of Electrochemical/Corrosion Behavior of Reinforced Concrete Specimens Exposed in Marine Environments

C. Kim, A.I. Karayan, H. Castaneda – Texas A&M University  
D. Choe – Prairie View A&M University; P. Castro – Cinvestav  
A. Okeil – Louisiana State University  
M. Taha – University of New Mexico

### High School Students Building and Using Sensors Towards Smart Management of Transportation Systems

Fernando Moreu, Christopher Lippitt, Rhytham Soni, Ali Ozdagli, Bideng Liu, Xiaomeng Li, Emmanuel Ayorinde, Su Zhang – University of New Mexico

### Development of a Thermal Energy Harvester for Powering Structural Health Monitoring Systems in Remote Areas

Utpal Datta, Andrew Ortega, Samer Dessouky, A.T. Papagiannakis – University of Texas at San Antonio  
Aydin Karsilayan – Texas A&M University

## Session 4B: Concrete Materials

Moderator: Tyson Rupnow | *Frenchman II (2nd Floor)*

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 increase the durability of concrete materials and concrete structures, while using locally available products/by-products; effectively constituting these high-performing materials more cost-effective and implementable. Join us to learn more about: (1) testing the feasibility of rice husk ash as a suitable supplementary cementitious material, (2) optimizing engineered cementitious composites (EECs) for potential field implementation using local materials, and (3) developing ultra-high performance concrete (UHPC) produced with local materials for bridge deck overlay applications.

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### Use of Rice Hull Ash (RHA) as a Sustainable Source of Construction Materials

Kazi Tamzidul Islam, Zahid Hossain – Arkansas State University  
Mohammad Badrul Ahsan – Tennessee Department of Transportation

### Low Fiber Content PVA-ECC for Transportation Infrastructure

Gabriel Arce, Hassan Noorvand, Marwa Hassan – Louisiana State University  
Tyson Rupnow – Louisiana Transportation Research Center

### UHPC Overlays on Concrete Bridge Decks

William Toledo, Ahmed Al-Basha, Craig Newtonson, Brad Weldon – New Mexico State University

### Characterizing and Understanding Self-Healing Microcapsules Embedded in Reinforced Concrete Structures Exposed to Corrosive Environments

R. Goldsberry, A.I. Karayan, H. Castaneda – Texas A&M University  
J. Milla, M. Hassan – Louisiana State University

### The Influence of Osmotic Pressure on the Deformation of Concrete Exposed to Sulfate Solution

Syeda Rahman – University of Texas at Austin  
Zachary Grasley – Texas A&M University

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