

Technology Today

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Upcoming Events

**National Highway Institute (NHI)
Course No. 380032A - Roadside Safety Design**

September 14-15, 2016
TTEC 100

**National Highway Institute (NHI)
Course No. 135041 - One Dimensional Modeling of River Encroachments of HEC/RAS**

September 26-28, 2016
TTEC 160

To view more events, please visit
<http://www.ltrc.lsu.edu>.

Louisiana Named Recipient of National Safety Grant

With the combined effort of DOTD and LTRC, Louisiana has recently been awarded a \$1.1-million grant from the Federal Railroad Administration (FRA) in a national effort to reduce railroad crossing fatalities and increase safety of railroad crossings along energy routes.

Currently, the Kansas City Southern Railway (KCS) hauls a monthly average of 50,913 tons of crude oil and ethanol through the Baton Rouge Corridor, which is a high-energy resource traffic route. This corridor is the second most dangerous corridor across the entire Kansas City Southern line and first in the state of Louisiana. In 2014, Louisiana ranked in the top five states for fatalities at railroad crossings with 13 fatalities.

However, with this grant, DOTD and KCS will improve the safety of railroad crossings in highly trafficked areas in Louisiana where energy products are frequently transported by rail with the goal of reducing fatalities, collisions, near misses, and obstruction incidents.

More specifically, Louisiana is targeting a six-mile stretch from North Street to Louise Street. An average of eight trains travel along this route each day. The grant will allow the upgrade of nine crossings with new gates and lights, widened roads, the installation of concrete medians with delineators, new pavement



markings, the relocation of sidewalks behind new signals, as well as many other improvements. In addition, six crossings will be permanently closed.

Since 2000, there have been 11 accidents that have resulted in four injuries along this corridor in Baton Rouge. Transportation and city officials look forward to the enhanced safety that this will provide in such a large-encompassing area in the city.

According to FRA Administrator Sarah E. Feinberg, "One of FRA's top priorities during the last year has been to reverse the uptick in fatalities at railroad crossings because most of these collisions and deaths are preventable." Feinberg also explains, "Today's grants will upgrade the warning systems at critical crossings and close others where crude oil and other energy products are transported."

If you would like to learn more about the Kansas City Southern Railway-Baton Rouge Corridor Project, please contact Shawn Luke, Highway/Rail Safety Unit, at Shawn.Luke@la.gov or External Programs Associate Director Vijaya (VJ) Gopu at v.gopu@la.gov.

DOTD Explores Drone Technology for Future Research



As advancements are made in drone and image sensory technology, researchers at LTRC are starting to take notice of potential applications in the transportation community. Researchers from the University of Missouri-Kansas City recently visited LTRC to demonstrate their latest prototype, the DJI inspire, which has been modified with a 400v DC to 24V DC tether for continuous operation allowing for many unique uses. The opportunity this technology provides in bridge monitoring, structural inspections, infrared abilities, and plotting/mapping could assist those in the civil engineering field as researchers continue looking for new ways to ensure road and bridge safety is maintained and design standards are high.

Visiting researcher, Assistant Professor Civil and Mechanical Engineering Travis Fields, Ph.D., explains, “We are currently working to improve structural inspections by reducing the cost and improving the information gathered compared to current techniques. Additionally, we are working to create practical standards for inspection operations. Several other researchers and corporations are now using unmanned aircrafts for inspections; however, no research has been conducted to identify what aspects of the vehicle or flight plan (i.e., how close to an object) are important when attempting to conduct an inspection.”

While drone technology is not currently fully utilized in the transportation world, LTRC Associate Director of Research Tyson Rupnow, Ph.D., believes the option is worth exploring. “Drone technology has the potential to fundamentally change the way we do business from items like observation of traffic control devices and setup to survey and as-built documentation to bridge inspection,” explains Rupnow. “Drones also have the potential to be used in hurricane relief efforts by mapping debris fields and the ability to monitor traffic in and around a work zone where a permanent traffic camera may not be readily available.”

By use of this new technology, Rupnow looks forward to the possibilities drones have in assisting the Department by providing detailed information and images that have previously not



More about **THE DJI INSPIRE**

The aircraft has several great features that make it an ideal candidate for structural inspection operations. First, the actual aircraft is primarily an off-the-shelf commercial unit that has an HD camera that can be fully controlled, viewed, and adjusted (exposure, video vs. photo, etc.) directly on the flight controller + tablet. The system also permits flights with multiple flight controllers, with the secondary controllers used solely to control the camera functions and position (this would be inspector’s controller).

The aircraft was then modified to incorporate our high power tethering system. The tether connects to a ground-based power supply system (which is powered directly from a gasoline generator) and sends high voltage electricity up the tether. On the aircraft is a regulator that converts the high voltage power to a battery-simulating 24V, thereby enabling unlimited flight operations at distances of up to approximately 500 ft.

— **Travis Fields, Ph.D.**
Assistant Professor
Civil and Mechanical Engineering
University of Missouri-Kansas City

been available. Rupow says, “Drone technology is a rapidly advancing technology with even more powerful camera and camera types being able to be mounted. Several systems available can even change out camera/equipment type based upon the current need of the individual/unit.”

Fields adds, “We anticipate the tethered units will enable commercial inspections and monitoring operations that were previously unattainable. Current aircrafts can operate for less than 20 minutes, which is impractical when attempting to perform inspections or monitoring of large structures. Additionally, the guidelines we are working to develop will help shape the future policies and standards regarding remote inspections in order to ensure safe, efficient, and effective flight-based inspection operations.”



Former LTRC Director Receives Highest Honor

With over 40 years of service, former LTRC Director Harold “Skip” Paul was named a 2015 recipient of the highly esteemed Charles E. Dunbar, Jr. Award, the highest honor classified state employees can receive for their service to the citizens of Louisiana. The Civil Service League bestows the award on local, state, and municipal civic service employees who distinguish themselves through unselfish service, contributions toward workplace improvement, personal initiative, and volunteer community service.

Paul has been a leader in his field for decades, driving research and partnerships to improve transportation research in Louisiana and beyond. He has surpassed the standards of public service in his field and consistently demonstrated his commitment to ensuring top-quality research and advancement of his colleagues and employees throughout his career with DOTD.

Widely recognized for his integrity and commitment to people and quality research, Paul left a legacy of devoted service to the state of Louisiana. Paul began his career with the DOTD in 1977. He steadily advanced into higher level positions. In 1986, his responsibilities within the Department grew with the creation of the Louisiana Transportation Research Center, where he was

named director in 2005. In the early 1980s, Paul began investigating polymer modified asphalt cements (PMAC) and was part of the task force that developed the PMAC specifications still in use today. His research also guided the application of Recycled Asphalt Pavement, crumb rubber asphalt, stone matrix asphalt, and open graded friction course. The latter two mix types are notable in promoting safety through improved stopping distances in wet weather, an invaluable contribution to the state. In addition to his work on asphalts, Paul directed and managed the first research projects for and application of high performance, high strength concrete.

Another preeminent example of his leadership in the field was found in his service participating in and leading over 30 committees for the Transportation Research Board (TRB) for over 25 years. In his work on these committees, he has shared innovative research from Louisiana while bringing collaborative solutions to transportation problems back to the state. He has long been DOTD’s voice in TRB and through his leadership roles on the AASHTO RAC committee and Standing Committee on Research. Paul’s thoughtful and far-reaching contributions as the RAC Chair and SCOR Vice-Chair left an impression on all individuals in classified service nationwide for years to come. He has been elevated to

[cont. on pg. 6]



LTRC 30th Anniversary: Where Were You in 1986?

LTRC was officially created on June 26, 1986, as part of the regular session of the Louisiana Legislature via Act 137 (originating as Senate Bill No. 520). Over the last 30 years, employees have come and gone, but there is one thing everyone can agree on: 1986 was a year to remember. So in honor of our 30th anniversary, we asked a few staff members, "Where were you in 1986?"

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"I was stationed at England Air Force Base, assigned to the 23 Tactical Fighter Wing, (Home of the A-10 Warthogs) completing my career."

–**Bob Breaux**, LTAP Office Manager



"I was in the 3rd grade at The Chapel School in Baton Rouge, LA. I spent most my time in the swimming pool or watching Scooby Doo."

–**Jenny Speights**, Public Information Director



"I was 23, working at Eckerd Drugs, still didn't know what I wanted to be when I grew up, and was about to get married!"

–**Sandy Brady**, Librarian

"I was in the 3rd grade at Cypress Springs Elementary in Ruston, Louisiana. I spent my free time in ballet and tap class and enjoyed reading Nancy Drew and Babysitters Club books."

–**Emily Wolfe**, Multi-Media Specialist

"In 1986, I was a sophomore at Catholic High School in Baton Rouge. I also worked at a local golf course picking up range balls, cleaning clubs and carts, and selling merchandise. Fun times in the summer swimming, camping, and playing golf. I remember the Space Shuttle disaster that year, and how it was on a TV in the school library. On the bright side, on that very same day, my nephew/Godchild was born."

–**Gavin Gautreau**, Senior Geotechnical Research Engineer



"I was 4 years old and either in Pre-K or going into Kindergarten. Ah, to be young and carefree."

–**Richard Black**, Training and Development Specialist



"During Christmas of 1986, I was 11 months old, and I went to New York City for the first time of my many trips I've made."

–**Garrett Wheat**, Teaching Associate, DOTD Leadership Development Institute





“In 1986, I was working for the Department in Section 28, the Environmental Section. I had been married for three years and didn’t have any kids yet. I was about to finish up my Master’s Degree. It was my second year with the Department. I was the archaeologist on staff and I did Cultural Resource Management. I also did surveys of the projects alignments to check for any unknown sites. Depending on the project, I either did an environmental assessment report or the project was signed off on as having no cultural impact. Sometimes we had to manage really large projects, like the time road workers uncovered an 1850’s cemetery under Canal Boulevard in New Orleans. That was a really fun and interesting project.”

–**Cindy Twiner**, DOTD Structured Training Director



“1986 is a memorable year for me. I graduated from Ponchatoula High School. I also started college that year; however, that was a different level of excitement.”

–**Paul Hendricks**, Computer Manager

“I was in first grade at Parkview Baptist, and I wanted to be a homemaker when I grew up.”

–**Mary Leah Coco, Ph.D.**, Associate Director of Technology Transfer and Training



“I was recommended for promotion to the rank of full professor by the CEE Department at LSU and began work on my first LTRC research project titled ‘Design Considerations for Bridge Deck Joint Sealing Systems.’ That project was the beginning of my 30-year association with LTRC.”

–**Vijaya (V.J.) Gopu, Ph.D.**, Associate Director for External Programs



Fun Facts from 1986

1 gallon of gas: 89 cents

Ford Mustang: \$7,452

Average cost of new house: \$89,430

World Series Champions: New York Mets

Superbowl XX Champions: Chicago Bears



The Big Movies:

1. Top Gun

2. Crocodile Dundee

3. Platoon



Most Popular TV show:

The Cosby Show (NBC)



Camcorders started to become a regular household item.

The Number One Hits of 1986:

Lionel Richie – “Say You, Say Me”

Dionne Warwick – “That’s What Friends Are For”

Other Things Turning 30



- The Olsen Twins
- Ferris Bueller’s Day Off
- Intel’s 386 Microprocessor
- Office Depot
- The 3D Printer

Highest Honor

cont. from pg. 3

the highest non-paid position in TRB and, in January 2014, received the TRB's W.N. Carey, Jr. Distinguished Service Award for his leadership and service in the field of transportation research over the course of his career. Paul also championed AASHTO TRAC and RIDES educational outreach programs for K-12 schools in LA to introduce students to the work world of transportation and prepare the next generation of engineers in the field.

Paul has served as President of the Louisiana Society of Professional Engineers in Civil Service, Vice President of the Association of Classified Employees, Chair of over 30 committees for the Transportation Research Board-National Research Council, Board Member of the Association of Asphalt Paving Technologists, Member of American Society for Testing and Materials, Member of Joint Task Group 31-AASHTO-AGC-ARTBA on Specifications for Polymer Asphalts, Member Expert Task Group SHRP A-004-Modified Asphalts, Member of Three NCHRP Synthesis Topic Panels, Member NCHRP Project 9-10-Expert Panel, Member FHWA Crumb Rubber Material Pooled Fund Study-Expert Panel, Member FHWA Demonstration Project 89-Expert Panel and has participated on many FHWA and National Academy of Sciences advisory groups and committees. He is the author or co-author of over 50 research articles and has managed many research project contracts. His commitment to bettering the state and LTRC have led him to continue to serve for two years beyond retirement eligibility. Captain Paul is a retired Navy Reserve Intelligence Officer with 42 years of service and a Blue and Gold Officer for the United States Naval Academy.

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Staff Updates and Accomplishments

LTRC Director **Samuel Cooper, Jr., Ph.D., P.E.**, was recently appointed as Research Professor of Civil Engineering to the Department of Civil Engineering Faculty at the University of Louisiana at Lafayette (UL). The appointment will allow Dr. Cooper to participate as a faculty member of the department as well as participate in R&D program development, department planning, student project involvement, and providing insight into future education directions for engineering students as well

as the opportunity to join the graduate faculty, allowing him to work directly with UL graduate students. Dr. Cooper is the first DOTD engineer to be appointed at this rank at a Louisiana university.

Dr. Cooper was also recently awarded Outstanding Ph.D. Dissertation from the Louisiana State University College of Engineering. His topic included "Sustainable Materials for Pavement Infrastructure: Design and Performance of Asphalt Mixtures Containing Recycled Asphalt Shingles."

On behalf of the Strategic Highway Safety Plan (SHSP) Communications Coordinating Council (CCC), the Louisiana Center for Transportation Safety (LCTS) spearheaded the development of a poster titled "Louisiana's 4E Regional Approach to Saving Lives: The Goal Is Destination Zero Deaths," which was presented at the "Poster Dash! 60 Minutes That Will Change Your Life" session at the Lifesavers Conference on April 3-5, 2016 at Long Beach, California. The regional coalition coordinators (and members of the CCC) collaborated with **LCTS Program Manager Rudynah Capone** to develop a poster that encapsulates Louisiana's



traffic safety work and success story. With leadership and guidance from **LCTS Director Dortha Cummins** and SHSP Manager Autumn Goodfellow-Thompson, the CCC was able to pull off a great poster to showcase to all conference attendees.

Vijaya (V.J.) Gopu, Ph.D., P.E., Associate Director for External Programs, was a member of the U.S. delegation that was invited to witness full-scale building tests conducted earlier this year at the Japanese E-defense test facility in Kobe, Japan. Dr. Gopu also made a presentation titled “Automated and Connected Vehicles – Issues, Challenges and Opportunities” to the ASCE Acadiana Branch in March 2016 and served on two NSF NHERI proposal review panels in the spring semester.

LSU Civil Engineering Professor and EMCRF Manager **Louay Mohammad, Ph.D.**, delivered an invited presentation at the 57th Annual Meeting and Convention of the Louisiana Asphalt Pavement Association on “Effects of Temperature Segregation on the Quality of Asphalt Pavements,” June 1-5, 2016, in Point Clear, Alabama.

Recently Published

Project Capsule 16-5P

Pavement Service Life Extension Due to Asphalt Surface Treatment Interlayer

Mohammad J. Khattak, Ph.D., P.E.

Project Capsule 16-1C

Radio Frequency Identification (RFID) Tagging for Material Tracking and Future Asset Management

Amar Raghavendra, P.E.

Project Capsule 16-4ST

Over Height Impact Avoidance and Incident Detection System

George Z. Voyiadjis, Ph.D.

Project Capsule 16-1ST

Retrofit of Existing Statewide Louisiana Safety Walk Bridge Barrier Railing Systems

William F. Williams, P.E.

Project Capsule 16-3ST

Live Load Rating of Cast-In-Place Concrete Box Culverts in Louisiana

Ayman M. Okeil, Ph.D., P.E.

Project Capsule 14-2P

Assessment of Structural Capacity Indicators from Rolling Wheel Deflectometer Data Collection in Louisiana

Mostafa Elseifi, Ph.D., P.E.

Project Capsule 16-3SA

Evaluating Cell Phone Data for AADT Estimation

Julius Codjoe, Ph.D.

Project Capsule 16-6GT

Incorporating the Site Variability and Laboratory/In-situ Testing Variability of Soil Properties in Geotechnical Engineering Design

Murad Y. Abu-Farsakh, Ph.D., P.E.

Project Capsule 13-2ST

Live Load Monitoring for the I-10 Twin Span Bridge

Steve C.S. Cai, Ph.D., P.E.

Final Report and Technical Summary 562

Hurricane Hazard Mitigation in Traffic Light Support Structures

Aly Mousaad Aly, Ph.D.; Hamzeh Gol Zaroudi; and Milad Rezaee

Final Report and Technical Summary 563

Field Instrumentation and Testing to Study Set-up Phenomenon of Piles Driven into Louisiana Clayey Soils

Murad Y. Abu-Farsakh, Ph.D., P.E.; Md. Nafiul Haque, Ph.D.; and Qiming Chen, Ph.D., P.E.

TIRE Report 14-2

LED Traffic Signal Management System

Leticia S. F. R. Courville, Ph.D., E.I.





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