Technology Today

Volume 31 Issue 3

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In this Issue

Upcoming Events

NFIP Floodway Regulations for DOTD Engineer
July 24
TTEC 100

National Highway Institute (NHI) Course No. 133121 - Traffic Signal Design and Operation
August 16
TTEC 100

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

LSU Hyperloop team includes (left to right) Connor Joslin, Girguis Sedky, Ross Armond, and Kristopher Meche. Photo credit: Cody Willhite, LSU.

LTRC Supports Students in Global Hyperloop Race

Imagine the ability to curb your craving for beignets at Café Du Monde in only 15 minutes. Now imagine getting into a pod that travels 750 mph through a tube to bring you there. Still hungry?

The future of transportation is in the shape of an enclosed vacuum tube that propels passengers long distances at airplane speeds in a train-like fashion, which is known as the Hyperloop. What seems like something out of the *Jetsons* is becoming a reality thanks to SpaceX and Tesla founder Elon Musk, his vision, a recent hyperloop competition, and a number of innovative and talented students, including some of Louisiana's best and brightest.

With help from LTRC/DOTD and other sponsors, a team of LSU students recently participated in SpaceX's Hyperloop competition where universities from across the globe were invited to design and develop a practical, safe, and scalable pod to advance this high-speed transportation technology. The pods are designed to carry goods or people while suspended less than an inch above the ground to resist causing friction while travelling speeds up to 750 mph.

Giovanni Sequeira, the LSU Hyperloop team's communications executive and head of the magnetic levitation subsystem explained, "After raising the interest of students in the project, the team decided what systems would be vital for a successful design. The final decision was made by valuing the effectiveness, weight, and cost of incorporating these features."

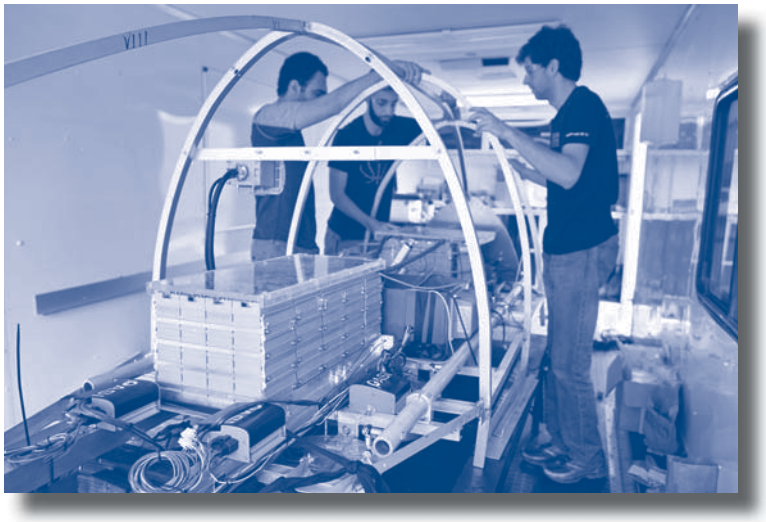


Photo credit: Cody Willhite, LSU.

Based on the submitted designs, teams were selected and invited to test their pods on a one-mile subscale track in SpaceX's headquarters in California earlier this year. The prototypes were judged for safety, innovation, construction, and speed. LSU's Hyperloop team was one of the few teams selected to move on to the building and test phase.

"The competition began with hundreds of teams, but after two years and several stages, only 30 teams were allowed to bring the prototype designs to Los Angeles," explained Sequeira. "The LSU team scored the highest in safety and transportation procedures of the pod out of all the teams present."

However, while the LSU team may not have made it to the final competitive stage, the experience and connections the team made were invaluable. In addition to interacting closely with SpaceX employees, the LSU Hyperloop Team gained important real-world engineering experience. "We learned to apply many concepts that we learned in class that you may not think were important until you actually get to see them in the real world. For example, we spent an entire day changing every bolt on the pod as we never took into account the grades of bolt required to withstand the forces experienced," said Sequeira.

Team members, who range from software to mechanical engineering majors, have hopes that a hyperloop will one day be running from New Orleans to Baton Rouge. Through their research, they have discovered that the presence of fast, accessible public transportation would alleviate highway congestion, ultimately resulting in greater public safety and reduced carbon emissions.

We may not know what the future holds, but we can thank these local innovators who helped bring Louisiana one step closer to newer and faster transportation possibilities.

Excerpt from the July 17, 1965 edition of the Sunday comic strip Our New Age (Novak Archive)

High-speed passenger pods predicted in 1965 comic

The 1965 comic strip "Our New Age" appeared to be ahead of its time by over 50 years. Through his comic, Athelstan Spilhaus, Ph.D., explained, "To solve auto traffic jams, city transport may move 5 or 6 passengers like peas in a pod, supported and blown along by jets of air through tubes small enough to pass right through buildings or stop in them."

Dr. Spilhaus's "Our New Age" ran in over 100 Sunday newspapers around the world from 1958-1975. He had a flair for the future and sparked American curiosity in science and technology through his comics. While, Dr. Spilhaus may have simply dreamed up an enclosed high-speed transportation system for his comic, scientists today are closer than ever to making that pipedream a reality.

Louisiana Aims to Reach Destination Zero Deaths

Partners in highway safety team up to reduce fatalities and serious injuries by 50% by 2030

By focusing on emphasis areas such as impaired driving, occupant protection, crashes involving young drivers, distracted driving, and infrastructure and operations, transportation leaders and stakeholders behind the Strategic Highway Safety Plan (SHSP) continue their efforts to reduce highway fatalities and serious injuries on all public roads through the program Destination Zero Deaths, a data-driven platform designed to save lives.

Every five years, the Louisiana Department of Transportation and Development (DOTD), the Louisiana Highway Safety Commission (LHSC), and Louisiana State Police (LSP), with support from the Federal Highway Administration (FHWA), work collaboratively to re-visit the crash data and update the plan's program priorities moving forward. This effort is made possible with input from champions and stakeholders representing various SHSP statewide emphasis area teams and the nine regional safety coalitions. These coalitions are established through the Metropolitan Planning Organizations (MPO).

There are many moving parts in the SHSP effort, but it's important to understand that Louisiana transportation safety leaders are relentlessly working towards a future where no one is killed or seriously injured in a roadway crash.

The SHSP has not only integrated both the engineering and behavioral factors to address highway traffic issues, it has also paved the way for an even stronger local stakeholder participation through the regional safety coalitions, DOTD districts, Louisiana State Police, and MPOs. The whole vision of the Destination Zero Deaths program is to create a safety culture at the regional and local level that is data-driven, inclusive, and proactive—all with the goal of saving lives and decreasing costs due to roadway crashes or careless driving.

Strategic Solutions: *The Regional Coalitions*

Helping realize the SHSP's vision of Destination Zero Deaths, DOTD partnered with the MPOs to establish nine regional transportation safety coalitions across the state. Forming and sustaining these coalitions have paved the way for increased local participation, better state-local agency coordination, and consistent highway safety messaging. Each coalition is led by a full-time safety coordinator that is staffed through the MPO and serves as a liaison between the state agency leaders and the local stakeholders from the following disciplines: enforcement, education, engineering, and emergency medical services. These are what's referred to as the 4 "E"s of Safety.

State Involvement: *DOTD Districts*

In addition to the Louisiana State Police actively championing efforts across the state, each DOTD district is involved with their regional safety coalition—in the infrastructure and operations arena. Data-driven tools to conduct safety network screening are being provided to the districts and MPOs in order to better facilitate project development and targeted investments of public funds.

Active Engagement: *Consistent Safety Messaging*

The Destination Zero Deaths effort inspired DOTD to embrace a more proactive approach in educating the public.

The LTRC's Publications Team works with the DOTD's Communications Team, LHSC's media representatives, State Police Public Affairs Division, and the regional coalition coordinators on efforts that increase public awareness and expand brand messaging. All of these teams comprise the SHSP Communications Coordinating Council (CCC) led by the LTRC's Safety Center in an effort to coordinate, collaborate, and communicate consistent messaging across Louisiana.

For more information, visit www.destinationzerodeaths.com. Or, you may email the Louisiana Center for Transportation Safety Center at lasafetycenter@la.gov. The Safety Center serves as the communication and outreach arm for the Destination Zero Deaths initiative.

LTRC Celebrates 30 Years

Current and former DOTD and LTRC professionals join together to present the center's accomplishments and cost-savings over the years

On Wednesday, March 8, 2017, LTRC speakers gathered to showcase their section's strengths and contributions to the state and local universities. From training to research, current and former employees, administrators, and directors were given a snapshot of why LTRC has been a leader in providing quality research and educational opportunities to the transportation community for the past 30 years.

Notable speakers from the event included LTRC Director Sam Cooper, Jr., Ph.D., P.E., DOTD Secretary Shawn D. Wilson, Ph.D., Commissioner of Administration Jay Dardenne, and DOTD Chief Engineer Janice Williams, P.E., who encouraged attendees by explaining, "I see the value of what you do. And we have an opportunity to make this a great job to the people after us."

Throughout the day, local presenters from LTRC's research and development, technology transfer and training, and external programs demonstrated high-value projects and notable accomplishments spanning from 1986-2016.

An example of such a project was one of the first investigations of reclaimed asphalt pavement (RAP) in the 1980s. Research Associate Director Tyson Rupnow, Ph.D., P.E., explained, "The results were implemented, saving on the cost of virgin materials for the last 37 years. Conservatively considering that DOTD paves 2 million tons of asphalt concrete per year and that asphalt concrete is approximately 5% asphalt cement and 95% aggregate, DOTD has saved over $300 million with the implementation of these results."

Associate Director of External Programs Vijaya (VJ) Gopu, Ph.D., P.E., also expanded on LTRC's external research support. "LTRC is playing an important role in securing federal transportation research dollars to support faculty and boost research activity at the state's universities and simultaneous address the research needs of DOTD." LTRC recently partnered with the university transportation center (UTC) National Center for Intermodal Transportation for Economic Competitiveness, where LTRC was able to support 15 research projects with a total budget of $2.6 million with an investment of $350,000. This paved the way for a new partnership with Tran-SET (a regional UTC) that will enable LTRC to support over 50 research projects over a five-year period with an overall budget of $6 million with an investment of approximately $1.2 million.

To round out the presentations, presenters from LTRC's training sections explained the ins and outs of the continual development of training programs based on the Department's needs, such as when PPM No. 59, Workforce Development, was created. This affected over 1,150 DOTD employees, and after an extensive review, 49 structured training programs were revised and PPM No. 59 consolidated all existing policies governing structured training programs under one directive.

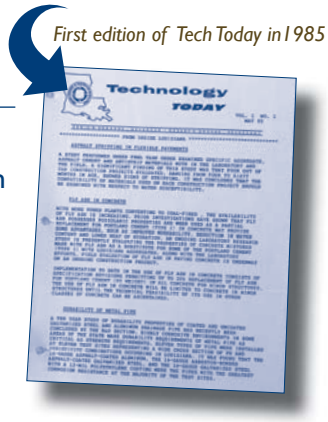
The publications department also highlighted one of the ways their section has evolved over the years by giving their presentation in video format. In addition to supplying continual editing and design of research documents, web-development, and implementation of registration systems for events and workshops, the publications department has published a number of high-quality videos on various subjects throughout the department, including special production assistance to the Secretary's office.

The anniversary program was followed by tours and equipment demonstrations in the LTRC laboratories, such as the Intelligent Transportation Systems (ITS) Laboratory—the newest lab designed to evaluate traffic data collected from Louisiana's traffic management centers.

The event concluded with a casual dinner reception thanks to our sponsors: American Council of Engineering Companies of LA; Caterpillar, Inc.; Concrete and Aggregates Association of LA Diamond B Construction Co., LLC; Ergon, Inc.; LA Asphalt Pavement Association; LA Associated General Contractors; Material Resources, Inc.

LTRC would also like to thank everyone involved in showcasing their efforts and collaborations with the center over the years. We look forward to continue building upon the groundwork that many people have worked together to establish over 30 years ago.

Tech Today Moves towards Electronic Distribution



First edition of Tech Today in 1985

It's been over 30 years since Technology Today was first published. Since then, the publication has undergone four redesigns and now reaches over 1,000 people each quarter. We are prouder than ever of the work and innovative engineering methods LTRC is contributing to Louisiana and the transportation industry as a whole, and we want to continue to communicate those advances in the best way possible as we move towards the electronic distribution of Tech Today.

As a whole, LTRC has been steadily incorporating paperless communication and sharing the center's latest updates and information on social media or our website. We are now giving readers the option to receive our newsletter through email that will continue to be published quarterly—with featured articles highlighted online in a special format.

If you would like to update your Tech Today subscription to electronic only and unsubscribe from our mailing list, please visit the following link to quickly switch preferences: ***http://www.ltrc.lsu.edu/update.html.*** Hard copies of Tech Today will still be available for mailing.

If you have any questions or would like to be removed from our mailing list entirely, you may also submit that through our online form or contact Jenny Gilbert at jenny.gilbert@la.gov.

Staff Updates and Accomplishments

Associate Director of Research **Tyson Rupnow**, Ph.D., P.E., and Associate Director of Technology Transfer & Training **Mary Leah Coco,** Ph.D. are serving as principal investigators on a new e-construction research project with Pavia Systems. Through their partnership and research, DOTD will use a new intelligence platform on 18 projects across the state putting mobile project inspection capabilities in the hands of over 200 project inspectors to evaluate the potential benefits of a statewide deployment. This new platform (known as Pavia Systems' HeadLight) enables transportation project inspectors and engineers to collect real-time project data including photo and video capabilities, equipment and personnel tracking, and automatic geolocation and timestamping for quick and comprehensive documentation of project activities to aid communication and risk mitigation. Implementation of the HeadLight platform by DOTD teams aims to help increase project management efficiencies and accuracy across its projects.

DOTD Program Specialist 4 **Allison Landry** was elected to serve as the 1st Vice President for the Louisiana Society of Government Meeting Professionals Louisiana Chapter for the 2017-2019 term. She has served as Secretary the last two years.

LCTS Safety Initiatives Manager **Rudynah Capone** presented about Louisiana's Destination Zero Deaths Communications Coordinating Council (CCC) efforts in a session titled "Leveraging Partnerships to Expand Impact and Reach" at this year's Lifesavers Conference held last March 26-28, 2017 in Charlotte, North Carolina. Her presentation highlighted how Louisiana Highway Safety Commission, Louisiana DOTD and State Police collaborate with the nine regional safety coalitions and local agencies to disseminate safety messages and engage the public through public service announcements and social media. Destination Zero Deaths is Louisiana's highway safety vision established through the collaborative and data-driven Strategic Highway Safety Plan (SHSP).

(From left) Rudynah Capone of LCTS, Cassie Parker of South Central Planning and Development Commission, and Donna Cavanaugh of Think First Ark-La-Tex at the Lifesavers Conference exhibit hall.

LSU Professor and EMCRF Manager **Louay N. Mohammad**, Ph.D., P.E. (WY), was appointed for a three-year term to the National Academies of Sciences Transportation Research Board Standing Committee on Surface Requirements of Asphalt Mixtures. Dr. Mohammad was also selected as a panelist in the National Cooperative Highway Research Program National Workshop on Warm Mix Asphalt Implementation and Usage.

LTRC would like to congratulate the following employees for passing the P.E. exam: **Taesun You** (LSU), **Khalil Hanifa** (DOTD), **David Mata** (DOTD), and **Julius Codjoe**, Ph.D. (LSU).

Recently Published

Project Capsule 17-1C

Effect of Clay Content on Alkali-Carbonate Reactive (ACR) Dolomitic Limestone

Amar Raghavendra, P.E.

Project Capsule 17-4SS

Dredging Louisiana's Navigable Waterways: a Statewide Systematic Approach to Meeting Dredging Needs

Mohan Menon, Ph.D., PMP

Project Capsule 17-5SS

Development of Guidelines for Ramp Metering Implementation and Performance Evaluation on I-12

Sherif Ishak, Ph.D.

Final Report and Technical Summary 570

Development of an Optimal Ramp Metering Control Strategy for I-12

Sherif Ishak, Ph.D., Osama Osman, Ph.D., Saleh Mousa, Sogand Karbalaieali, and Peter Bakhit

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Factors Influencing Seatbelt Utilization in Louisiana and Strategies to Improve Usage Rate

Helmut Schneider, Ph.D., Emily Pfetzer, Ph.D., William Black, Ph.D., and Jeff Dickey, Ph.D.

Final Report and Technical Summary 574

Building Accurate Historic and Future Climate MEPDG Input Files for Louisiana DOTD

Michael Heitzman, Ph.D., Geng Wei, Saeed Maghsoodloo, Ph.D., P.E., David Timm, Ph.D., P.E., Gene Takle, Ph.D., and Daryl Herzmann

Final Report and Technical Summary 576

Drugged Driving in Louisiana: Quantification of its Impact on Public Health and Implications for Legislation, Enforcement, and Prosecution

Helmut Schneider, Ph.D., and Emily Pfetzer, Ph.D.

Final Report and Technical Summary 578

Roller Compacted Concrete over Soil Cement under Accelerated Loading

Zhong Wu, Tyson Rupnow, Ph.D., P.E., and Moinul I. Mahdi

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LTRC Administration and Publications Staff

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