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IN THIS ISSUE

- 2** Edge Drop-off (Continued)
- 3** International Research Collaboration
- 5** DOTD Leadership Development Program
- 7** Staff Updates and Accomplishments
- 7** Recently Published

UPCOMING EVENTS

National Highway Institute Course No. 134001—
Principles and Applications of Highway Construction
Specifications
December 6-7, TTEC 100

LADOTD GIS Data Workshop
January 25, TTEC 175

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

RESEARCH

Researchers Explore Solutions to Roadway Edge Drop-offs

DOTD can improve roadway shoulders by utilizing readily available materials

Road shoulders serve as a safety feature for roadways, offering additional space for emergency pullovers. Over time, roads may receive more layers of asphalt to enhance their smoothness and longevity. However, these extra layers can create a height difference compared to the shoulder, known as an “edge drop-off.” An edge drop-off presents a potential safety hazard, as it can lead to a loss of vehicle control or hinder re-entry onto the road from the shoulder.

However, not all shoulders are asphalt—some are soil, grass, or gravel. Ensuring the safety and upkeep of these shoulders requires a considerable investment of time and resources. In order to improve roadway shoulders and drop-off, LTRC Geotechnical Research Engineers Gavin Gautreau and Nick Ferguson initiated a study to explore potential solutions. Ferguson explained, “The shoulders along roadways should be a safe area for travelers who need to make an unexpected stop, and a significant edge drop-off could deter a vehicle from reentering the roadway.”

continued on page 2

Researchers explain that when vehicles drive on these non-asphalt shoulders, their tires can disturb the soil and cause further erosion, increasing the height of edge drop-off. This requires DOTD district personnel to travel and patch these areas, ideally in a quick and economical way utilizing readily available materials or blended mixtures.

Sustainable Solution

One such readily available material is reclaimed asphalt pavement (RAP), which is abundant statewide and can be readily incorporated into solutions. LTRC conducted a survey among the nine DOTD districts to see how edge drop-offs have been addressed in the past and with what type of material. Survey results indicated that RAP was indeed the material most often utilized when available. “However, when RAP with its limited asphalt content ages over time, it behaves more like a gravel,” explained Gautreau. “And so, we thought to add clay and other materials to help stick it together to stay in-place longer.”

The goal was to find a cost-effective solution that district forces could tackle with available materials. Researchers evaluated the effectiveness of different combinations of RAP and soil with additives like fly ash or cement to improve strength in these blended mixtures to hopefully eliminate drop-off safety issues across the state.

Optimal Material Blend

Over 270 samples were molded of various amounts of RAP and lean clay—with and without the addition of cement, fly ash, and emulsions (commonly used as tack coat to patch asphalt). Samples with additives were cured (added to our moisture room to improve density and strength) for 7- or 28-day intervals. Researchers crushed the samples to measure their unconfined compressive strength (UCS) and California bearing ratio (CBR). Samples were put through wet-dry durability tests to see how weathering would affect performance.

Researchers found the best material blend was a sample mixture of 75% RAP and 25% lean clay with an additive of 4% to 6% cement. This mix performed well in both performance in terms of strength and durability while minimizing additive costs.

By harnessing the potential of RAP and optimizing its blend with lean clay and a small addition of cement, researchers have discovered a promising, cost-effective solution. This material blend not only excels in resilience and longevity but also minimizes the need for excessive additives, ultimately reducing costs.



Another way to enhance roadway safety

is to incorporate rumble strips to reduce lane divergence through sounds and vibrations. Other innovations include the Federal Highway Administration’s Safety Edge®, which creates a smoother road edge and has already been implemented by DOTD to reduce the severity of edge drop-offs and increase the ability of vehicles to return to the travel lanes. Also, DOTD Pavement Management’s iVision is software that locates problematic edge drop-off locations for proactive repairs. And recently, DOTD District 58 successfully deployed tractor attachment to blend, compact, and finish shoulder material. The group was acknowledged at the Louisiana Transportation Conference with an award for their innovative implementation.



For more information on this project and its findings, please visit www.ltrc.lsu.edu/pubs_final_reports.html and select Final Report 675 or contact Gavin Gautreau at (225) 767-9110 and gavin.gautreau@la.gov or Nick Ferguson (225) 767-9127 and nicholas.ferguson@la.gov.

RESEARCH

International Research Collaboration Finalized

LTRC partners with Philippine university to advance external research efforts abroad

By Rudynah Entera Capone, MPA

After four years of discussions and evening virtual meetings (considering the 13-hour difference), LTRC's Director, Dr. Sam Cooper, Jr., and External Programs Associate Director, Dr. Vijaya "VJ" Gopu, recently finalized an international research collaboration with the Center for Policy, Research and Development Studies (CPRDS) at the University of San Jose-Recoletos (USJ-R) based in Cebu City, Philippines.

The Memorandum of Understanding (MOU) signing was hosted by LTRC via Zoom on June 26, 2023. Present at the signing were Dr. Gopu, Dr. Cooper, LTRC's Associate Director for Research Dr. Tyson Rupnow, LTRC's Special Studies Research Administrator Dr. Julius Codjoe, and Louisiana Department of Transportation and Development's (DOTD) former Chief Engineer Chris Knotts. Representing USJ-R were University President Rev. Fr. Eduardo Celiz, Jr., Vice President for Academic Affairs Rev. Fr. Jose Alden Alipin, School of Engineering Dean Dr. Dennis Kilongkilong, and CPRDS Director Englevert Reyes. A few of their faculty members also attended.

Arguably, the transportation issues that motorists encounter in Cebu City are similar to those Louisianans struggle with, including: heavy traffic jams, pedestrians' safety, the integration of alternative transportation modes, the presence of vulnerable road users, and deteriorating transportation systems. Research on asphalt and concrete materials is also an area of interest for USJ-R's team.

Dr. Cooper anticipates the MOU will serve the transportation industry as we move towards a sustainable infrastructure. He stated, "Our mission is to promote LTRC and Louisiana DOTD not only nationally but internationally as well. This partnership definitely helps this cause. We will collaborate to promote research, technology transfer, and technology in addition to advancing higher education. We hope that both parties sustain this effort for several years as we move actively into the future."



Capone (middle) is flanked by (from left) CPRDS Director Englevert Reyes, Civil Engineering Department Chair Elvira Sales, School of Engineering Dean Dr. Dennis Kilongkilong, and Faculty Research Program Coordinator Engr. Randy Salazar.

Dr. Gopu emphasizes the MOU with USJ-R expands the ability of LTRC's research staff to engage in international collaborative research efforts that offer opportunities to address challenging global transportation issues. He said, "We at LTRC plan to explore opportunities for short-duration research faculty visits and exchanges to enhance research collaboration and technology transfer. We will encourage qualified USJ-R students to consider pursuing graduate studies at LTRC's partner state universities. We are looking forward to a meaningful and fruitful long-term relationship with USJ-R in a wide spectrum of areas."

Dynah Capone, LTAP Innovation and Technology Transfer Manager, proposed this Philippine-Louisiana research pact with her alma mater (USJ-R) after a 2019 homecoming visit to Cebu City. Without hesitation, Dr. Cooper recommended exploring this project with Dr. Gopu, who expressed a keen interest from the beginning. Despite COVID-19 delaying the progression of things, the MOU is now signed and contains the following goals:

- Promote collaborative research projects between USJ-R and LTRC
- Collaborate to organize scientific conferences or workshops
- Encourage and facilitate the participation of staff/researchers in conferences and workshops held by either of the entities
- Promote staff exchange programs
- Pursue funding opportunities
- Share the development and research needs of each party
- Facilitate opportunities for post-graduate studies for interested students
- Encourage joint authorship of refereed publications
- Provide access to articles and reports published by both parties



Capone (seated rightmost) visited the staff and faculty members of USJ-R: (front row, L-R) Innovation and Technology Support Office staff Jesse Susada, CPRDS Director Englevort Reyes, and CPRDS Secretary Ingrid Ramos; (back row, L-R) Faculty Association President Roberto Cabardo, Journal Circulation Manager Chanine Sevilla, Journal Public Coordinator Jessica Magallon-Avenido, and Faculty Research Coordinator Engr. Randy Salazar.

USJ-R's Research Aspirations

Founded in 1947, the USJ-R, colloquially shortened as San Jose, is a private Catholic research and co-ed basic and higher education institution run by the Order of Augustinian Recollects. USJ-R's research center is an academic service unit under the Office of the Vice President for Academics.

CPRDS Director Englevort Reyes explains their university's history of international collaborative research dates back almost three decades ago under the leadership of the first research director, Dr.

Carmen Eturma. "This isn't our first international venture. We have several ongoing international collaborations, although they encompass a broader scope of activities, unlike this collaboration with LTRC that emphasizes research," Reyes remarked.

He relates that USJ-R envisions becoming a prominent research institution on a global scale. "To achieve our goal, it is crucial that we establish a distinct research niche. The field of transportation research aligns with the current research efforts of our School of Engineering faculty and students, making it an ideal opportunity to embark on this partnership with LTRC," he added.

Reyes mentions the types of activities they hope to get out of this partnership, including mentorship from LTRC experts, sharing of transportation-related data and insights within the Philippine context with LTRC, providing international exposure to their faculty and students, and collaborating on research publications as co-authors, among many others. Reyes emphasized, "These activities will enrich our capabilities and global presence."

USJ-R, with its strong community-oriented ethos, will undoubtedly reinforce its mission through this partnership with LTRC. "We are committed to creating a meaningful impact in our local community and the broader country, and the transportation sector presents an avenue where we can contribute significantly. This partnership aligns with our mission of 'Caritas et Scientia' and will further the goals of our research center to make a lasting difference in our society," Reyes said.

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TRAINING

Enhancing DOTD's Workforce through Leadership Development

In early 2023, DOTD's Management Development Training Program was replaced by the Leadership Development Training Program. Housed at LTRC, the program is a compilation of strategically established leadership courses that are applicable to the wide variety of employee types within DOTD. The difference between these names may seem subtle, but the change in title represents a shift in DOTD's philosophy towards leadership.

Eliminating Manager Mindset

"We're trying to develop leaders, not managers. Managers are mainly compliance-based, while leaders are compliance and relationship-based," said Marcus Sylvas, one of LTRC's primary instructors of Leadership Development courses.

While a management-oriented career path may be appealing to some employees, others may feel that becoming a manager does not align with their preferences and goals. This is where the distinction between the old and the new programs becomes highly relevant. According to Sylvas and his fellow instructor Layne Brown, leadership is not tied to your place on an organizational chart or your job title. "Leadership" refers to a set of skills and behaviors that can be developed over time. The more that members of a workforce embody leadership skills and behaviors, the more they can help build guidance and trust throughout the organization, benefitting the entire Department.

Leadership development courses are required early in an employee's career. The skills they reinforce (emotional intelligence, conflict management, professional writing, etc.) apply to DOTD employees in various roles and work areas. Brown explained, "[These opportunities] give leaders the tools to reinforce the innate skills they already have as a leader."

Furthermore, DOTD employees will now consistently be able to take Leadership Development courses internally. An in-house training staff, consisting of Brown, Sylvas, Ted Ball, and Claire Dixon, will host training at LTRC's TTEC facility, as well as at DOTD offices statewide, as demand requires.



Marcus' Travel log



"After about two hours of driving and eating the Darrell's special at Darrell's Famous Poboy's, I was ready to teach class the next morning."



"The class took place at White Oak Park and was comprised of 19 DOTD employees, which consisted of different professions and different levels of experience."



Empowering Leaders Through Emotional Intelligence

In fact, Marcus Sylvas, Leadership Development Program Manager, recently traveled to Lake Charles to teach "Emotional Intelligence," one of the most requested leadership classes by DOTD employees.

Sylvas explained, "Classes with variety, such as this one, allow experienced employees to share tips with newer employees, allowing newer employees to share perspectives and insights that experienced employees may not have considered."

The Emotional Intelligence course focuses on recognizing and developing emotional skills. These skills allow leaders to communicate effectively and build lasting interpersonal relationships. As Sylvas presented the course material, the class was able to relate examples to their professional experiences.

One long-term DOTD employee expressed how important this topic was and how the development of these skills made her time at DOTD fly by. After a couple of other experienced employees agreed, Marcus said, "If people with 10, 15, and 20+ years of experience can say time has flown by, then you know this information means something. When employees share their experiences, it provides an environment where employees can share experiences and learn new skills."

The Numbers Behind Leadership Development

According to the latest data, a significant portion of DOTD's workforce is required to participate in Leadership Development courses. Out of the 4,021 DOTD employees, 1,086 are designated for Leadership Development training across different employee groups, including entry-level, staff, managers, and administrative personnel. Additionally, the Leadership Development Technician (LD Tech) Program is designed for senior and supervisory engineer technicians.

Continuing the Journey

LTRC's dedication to leadership development ensures that DOTD's workforce remains equipped with the skills and knowledge needed to excel in their roles and contribute to the organization's overall success.

For more information about these courses or to inquire about offerings, please contact (225) 767-9112 or Marcus.Sylvas2@la.gov.

STAFF NEWS

Updates and Accomplishments

Leadership Development Program Manager **Marcus Sylvas** and Statewide Strategic Program Manager **Garrett Wheat**, Ph.D., were invited to present during the LPESA Fall Conference Leadership Hour. Their presentation “On Self-Awareness in Leadership across Various Generations” shared how self-awareness plays an important role in effective leadership and management. Since the various generations in the workplace dictate their own style of leadership and communication, attendees were encouraged to participate in group activities designed to help find commonalities and misconceptions about their own generation.



Professor, SRPC Director **Louay Mohammad**, Ph.D., P.E. (WY), F. ASCE, recently delivered an invited presentation titled “Environmental Impact Analysis into Louisiana’s Balanced Asphalt Mixture Design: A Case Study at the Louisiana Civil Engineering Conference and Show” on October 4-5, 2023.

Congrats to **Hannah Boggs** on her new position in Section 33 as the new Asphaltic Concrete and Special Topics Training Program Manager in the Internal Training group.

External Programs Associate Director **Vijaya (VJ) Gopu**, Ph.D., P.E., has been named a fellow by the ASCE Board of Direction.

PUBLICATIONS

Recently Published

Final Report and Technical Summary 684 (22-1SA)

Safety Effectiveness of Cable Median Barriers in Louisiana

Elisabeta Mitran, Ph.D.; Xiaoduan Sun, Ph.D., P.E.; and Safkat Tajwar Ahmed

Final Report and Technical Summary 682 (17-2GT)

Update the Pile Design by CPT Software to Incorporate Newly Developed Pile-CPT Methods and Other Design Features

Murad Y. Abu-Farsakh, Ph.D., P.E.; Mohsen Amirmojahedi; Md Ariful Mojumder; and Mohammad Moontakim Shoailb

Final Report and Technical Summary 673 (16-6GT)

Incorporating the Site Variability and Laboratory/Insitu Testing Variability of Soil Properties in Geotechnical Engineering Design

Murad Y. Abu-Farsakh, Ph.D., P.E.; Md. Habibur Rahman; and Abu Hakim Faisal



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LOUISIANA TRANSPORTATION RESEARCH CENTER
4101 Gourrier Avenue
Baton Rouge, LA 70808-4443
DOTD Section 33

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Vijaya (VJ) Gopu, Ph.D., P.E., *Associate Director, External Programs*

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