CENTER FOR INFRASTRUCTURE RENEWAL

NEWSLETTER

SPRING 2025

Our center continues to experience remarkable growth in student workforce training and research engagement. Over the past year, students working at CIR have earned numerous scholarships and awards—an inspiring reflection of their dedication and the exceptional mentorship they receive.

In Fall 2023, we proudly hosted 28 student participants in our Student Research Showcase. Due to overwhelming interest, we are now capping the event at 50 students, simply due to space limitations. This surge in participation is a testament to the expanding impact of our programs.

Our research community has also grown significantly. We now include over 35 Laboratory Leads and Principal Investigators (PIs), more than 15 postdoctoral researchers, and over 60 graduate student researchers. This growth spans not only in numbers but also across a wide range of disciplines, broadening our reach and impact.

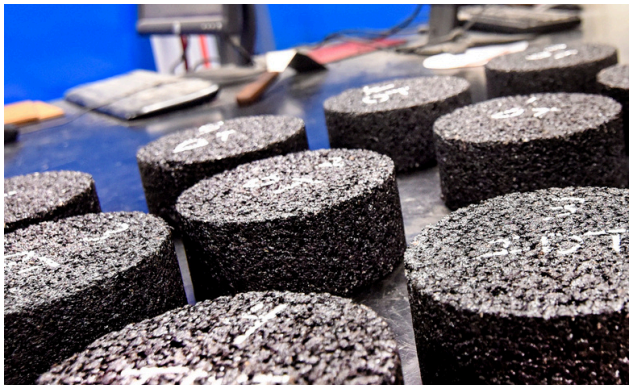
We are supported by faculty and staff from across the Texas A&M University System, including TEES and TTI engineering divisions, Construction Science, Architecture, Animal Science, and Food Science & Technology. Our updated website now reflects all our research areas, including several exciting new additions.

We are truly energized by this momentum and look forward to continued collaboration, innovation, and student success. More details and highlights can be found in this issue of our newsletter.

Thank you—and please don't hesitate to share your feedback with us!

Anand Puppala

Dr. Anand Puppala
Director



FACULTY NEWS & RECOGNITION

Dr. Jonathan Snodgrass of SGC Recognized with 2025 Staff Excellence Award

Dr. Jonathan Snodgrass, Senior Research Engineer in the Department of Electrical and Computer Engineering and Assistant Director of the TEES Smart Grid Center housed in the CIR, has been selected as a recipient of the 2025 Staff Excellence Award, a testament to his outstanding performance and dedicated service to Texas A&M Engineering.

This honor reflects his continued commitment to excellence and his impactful contributions to the university community.

Dr. Thomas Overbye of SGC Receives 2024 College-Level Teaching Award

Dr. Thomas Overbye, professor in the Department of Electrical and Computer Engineering and Director of the TEES Smart Grid Center housed in the CIR, has been honored with the 2024 Association of Former Students College-Level Teaching Award.

This prestigious recognition highlights his exceptional contributions to teaching and his ongoing commitment to student success.

Dr. Overbye continues to inspire both undergraduate and graduate students through his engaging instruction and leadership in cutting-edge research initiatives.

Dr. Petros Sideris Presents Seminar at National Technical University of Athens

Dr. Petros Sideris recently returned to his alma mater, the National Technical University of Athens, to deliver a seminar highlighting his research group's latest work in additive construction. The visit offered a meaningful opportunity to share innovative developments in the field and fostered engaging discussions, thereby strengthening the academic ties between institutions.

Empowering TOPS: TCAT's Role in Developing TAMU Insights

The TCAT software development team will be helping to develop and maintain TAMU Insights, a database management system that will enable tracking and reporting on key data relating to the important activities occurring across the Texas Opioid Prevention for Students (TOPS) project.

TAMU Insights is actively under development and will provide an easy-to-use tool for everyone involved in the program. In addition to the database management system, TCAT will also be developing several other important tools that will help with outreach and awareness efforts.

Cooperative Asphalt Pavement Research Initiative Meeting (CAPRI) held at CIR in April

The Consortium for Asphalt Pavement Research and Implementation (CAPRI) Spring 2025 Meeting was hosted at the CIR in April by Dr. Jon Epps of the Texas A&M Transportation Institute (TTI) and Dr. Amy Epps-Martin of Texas A&M University. CAPRI brought together transportation professionals, researchers and industry leaders to discuss improving asphalt pavements by addressing knowledge and research gaps in the industry. The meeting welcomed over 60 attendees, reflecting strong interest and engagement from across the asphalt pavement community.

Key topics included Balanced Mix Design (BMD), the use of recycled materials, and long-term pavement durability. Attendees participated in research presentations and toured the TTI asphalt laboratories within the center. During the subcommittee breakout sessions, participants discussed critical issues, technology evaluation, technology transfer, and the research roadmap. The event concluded with subcommittee report-outs and strategic discussions to guide future CAPRI efforts.

CENTER ACTIVITY

Building a Community of Emerging Scholars

The Center has seen exceptional growth in recent years, now comprising a vibrant and diverse team of over 50 undergraduate and 125 graduate student researchers, 32+ faculty members, 15+ postdoctoral researchers (TEES/TAMU), and 25+ full-time research staff (TTI).

At the heart of our success are our student researchers. Their energy, creativity, and dedication fuel the Center's progress across a wide range of initiatives. From developing cutting-edge technologies and analyzing complex systems to shaping impactful policy recommendations, our students are making meaningful contributions every day.

Their work not only advances the Center's mission but also plays a vital role in shaping the future of transportation and infrastructure research.

We are proud to support their journey as scholars, innovators, and future leaders—and we remain committed to fostering an environment where they can thrive.

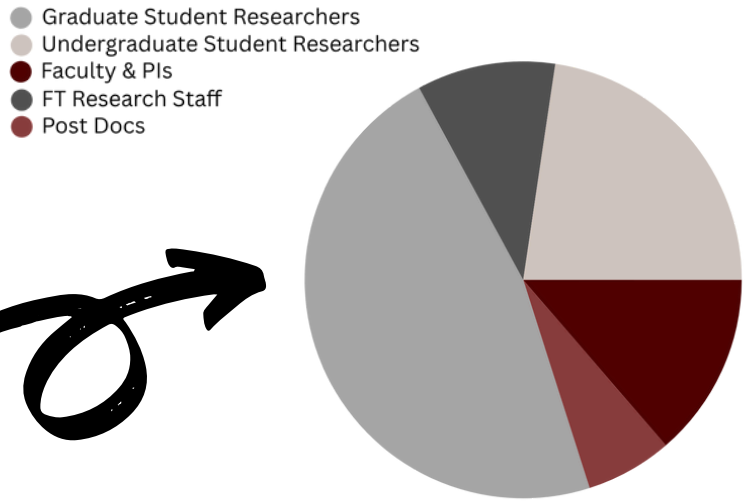
Center Funding Sources

The Center continues to thrive thanks to a diverse portfolio of funding sources and, most importantly, the dedication and innovation of our student researchers. Their work is at the heart of our mission, driving progress across a wide range of disciplines.

On the TEES side, the majority of research funding comes from federal sources (54.7%), with additional support from University Transportation Centers (22.1%), the private sector (14.1%), and state agencies (9.1%). This broad support reflects the Center's strong alignment with national research priorities and industry needs.

On the TTI side, funding is primarily provided by the State Government (80.6%), with contributions from UTCs (6.9%), universities (6.1%), the private sector (6.0%), and a small portion from federal sources (0.5%). This distribution highlights the Center's essential role in shaping state-level transportation research and policy.

Fiscal Year 2025 Research Personnel



Recent Lab Access and Safety Updates

We would like to extend our sincere appreciation to everyone for their cooperation, patience, and understanding during the recent transition period as we updated our safety procedures, lab access protocols, and overall research security measures.

These improvements are essential to maintaining a safe, secure, and productive environment for all researchers, students, and staff. We recognize that transitions can bring temporary challenges, and we are grateful for the professionalism and flexibility shown by our entire community throughout this process.

Your continued support is vital to the success of our center, and we are excited about the stronger, safer foundation we are building together for the future of our research!

Upcoming Short Courses hosted at CIR:

- National Corrosion and Materials Reliability Lab: Fundamentals, Experiments, and Applications of Corrosion (August)
- Smart Grid Center Short Course: Primer on the Planning and Operation of Large-Scale Electric Grids Three Day Short Course (September)
- Smart Grid Center Short Course: Fundamentals of Electric Transmission System Planning Three-Day Short Course (October)

FOR REGISTRATION INFORMATION, UPDATES AND UPCOMING COURSE OFFERINGS VISIT CIR.TAMU.EDU/WORKFORCE-DEVELOPMENT OR SCAN THE QR CODE!

RESEARCH HIGHLIGHTS & STUDENT ACTIVITY

Explore the Latest Highlights from Our Students and Faculty!

From groundbreaking research to real-world impact, our community continues to push the boundaries of innovation.

Stay informed and inspired! Visit ***cir.tamu.edu/news*** for more research highlights and news updates.

Supporting the Roads that Support Us with Texas A&M Engineering

Texas A&M civil engineers have conducted a detailed forensic investigation into the failure of an embankment slope along a major Houston highway.

Led by Dr. Anand Puppala, the research team investigated the causes behind the collapse, which are often linked to the use of compacted clayey soils, common in Texas. These materials, while locally available, tend to degrade over time due to weathering and heavy use, resulting in instability.

The team performed on-site investigations, collected soil samples, and conducted laboratory tests to assess the soil's shear strength. Using this data, they developed numerical models to analyze slope stability.
Their findings aim to inform better construction and maintenance practices for highway embankments, ultimately enhancing the safety and longevity of critical transportation infrastructure.

HVIL Celebrates Their 800th Shot in April

Established in 2020, HVIL features a state-of-the-art two-stage light gas gun (2SLGG) capable of launching projectiles at velocities ranging from .1 to 8.0 km/s. This lab plays a crucial role in developing and testing materials designed to withstand extreme conditions, such as those encountered in reentry from space and micrometeoroid and orbital debris (MMOD) protection. HVIL's advanced diagnostic tools, including ultra-high-speed cameras and flash X-ray systems, enable detailed analysis of hypervelocity impacts, contributing significantly to aerospace and space defense technologies. On April 22, 2025, they celebrated their 800th firing from the 2SLGG and are on pace to complete their 900th by mid July.

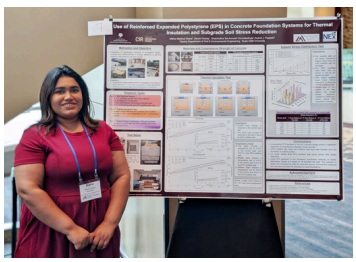
Improving Bridge Construction Across Texas

A new TxDOT-funded research project led by Dr. Kinsey Skillen at Texas A&M University is exploring innovative methods to enhance bridge construction. The 42-month, nearly $1 million study focuses on refining design provisions for steel reinforcement in bridge joints—specifically using hooked and headed bars—to improve structural performance and accelerate construction.

Full-scale testing is underway at the Center for Infrastructure Renewal and UTSA, with the goal of providing TxDOT engineers with updated, practical design guidelines for future bridge projects.

Pioneering Sustainable Solutions at the IAI Summit

At the Infrastructure Advancement Institute Summit in Houston, Dr. Puppala's research team presented cutting-edge work in sustainable construction. Zoheb Faisal showcased the potential of Soil-Geopolymer Composites (SGC) as eco-friendly materials for soil stabilization and lean concrete applications, while Mahia Mahbub Riana highlighted how EPS-reinforced concrete foundations can enhance thermal insulation and reduce stress on subgrade soils. Both presentations sparked strong engagement and received praise from industry professionals for their innovation and relevance.



RESEARCH HIGHLIGHTS & STUDENT ACTIVITY

ACI Foundation Fellowship Awarded to Research Student

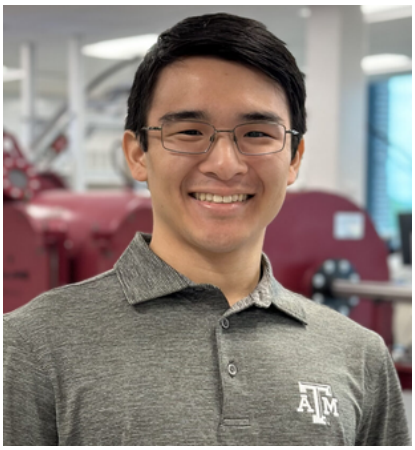
We are proud to celebrate Yoonjung Han, who was awarded the prestigious ACI Foundation Fellowship! This is a recognition of her outstanding academic excellence, leadership, and dedication to the field of concrete and structural engineering.

Adding to this achievement, Yoonjung also successfully defended her Ph.D. in May, marking a major milestone in her academic journey. (Advisor: Jeff Bullard)

Engineering Students Excel in GeoPrediction Event

At Geotechnical Frontiers 2025 in Louisville, KY, two student teams tackled a real-world dam seepage challenge at the GeoPrediction event.

Debayan Gosh's team earned 3rd place, and Avinash Gonnabathula and Kort Harms placed 4th, both demonstrating excellent analytical and geotechnical skills. (PI: Anand Puppala)



HVIL Student Awarded Prestigious DoD SMART Fellowship for Ph.D. Research at Texas A&M

Garrett Kawaguchi, a Ph.D. student in mechanical engineering at Texas A&M University, has received the prestigious Department of Defense SMART Scholarship-for-Service Fellowship. He conducts his research in the Hypervelocity Impacts Laboratory (HVIL) under the guidance of PI Dr. Thomas Lacy, focusing on advanced materials and structures for extreme environments.

The SMART Fellowship provides full tuition, a stipend, and post-graduation employment with the DoD, supporting Garrett's contributions to national defense through cutting-edge research.

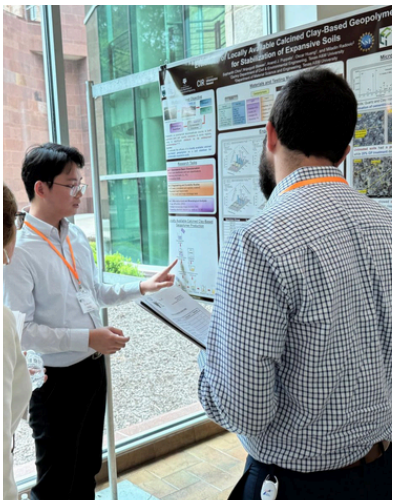
Inaugural ASCE GI Texas Chapter Conference

The research group had a dynamic and rewarding experience at the inaugural ASCE Geo-Institute (GI) Texas Chapter Conference, held in San Antonio. This landmark event brought together geotechnical professionals, researchers, and students from across Texas to exchange ideas and showcase advancements in the field.

Representing Texas A&M University, the team made a strong impression through a series of oral and poster presentations that highlighted cutting-edge research in geotechnical engineering, including innovative approaches to soil stabilization, infrastructure resilience, and sustainable ground improvement techniques.

The group actively engaged with industry leaders and academic peers, fostering meaningful discussions and potential collaborations. Their participation not only underscored a commitment to advancing geotechnical knowledge but also reinforced Texas A&M's leadership in civil and environmental engineering research.

The conference served as a valuable platform for professional development, networking, and sharing impactful research that addresses real-world engineering challenges.



RESEARCH HIGHLIGHTS & STUDENT ACTIVITY

NCMRL Showcases Research Excellence at AMPP 2025

The National Corrosion and Materials Reliability Lab (NCMRL), a research group within the Center for Infrastructure Renewal (CIR), made a strong impact at the 2025 Association for Materials Protection and Performance (AMPP) Conference and Expo in Nashville, Tennessee.

NCMRL students and researchers were active across the conference—from presenting cutting-edge research on corrosion inhibition and materials durability to engaging in technical discussions and networking with industry professionals. Highlights included Ph.D. student Abdul Mannan's presentation on ionic liquid corrosion inhibition and multiple poster sessions led by graduate and undergraduate researchers.

The lab also celebrated a major achievement as undergraduate student Rebecca Crow received the prestigious Melvin J. Schiff Scholarship, awarded by the SoCal AMPP Chapter and Schiff Associates.

Dr. Homero Castaneda-Lopez, lab supervisor and CIR faculty member, praised the team's performance: "Our team exceeded expectations this year. The level of engagement and the number of collaboration requests we received speak volumes about the quality of our work."

CIR is proud to support NCMRL's continued leadership in corrosion science and materials protection, and we look forward to their contributions at AMPP 2026 in Houston.

GeoWall Competition

At Geotechnical Frontiers 2025 in Louisville, KY, TAMU GeoWall team, Amirhossein Afshariaghajari, Rohan Vadiya, Gustavo Hernandez Martin, and Brandon Garcia—qualified for the finals and represented the university with a strong performance.

Research Group Shines at EMI 2025

Texas A&M Engineering was well represented at the 2025 Engineering Mechanics Institute (EMI) Conference in Anaheim, CA.

The team was comprised of postdoctoral researchers Sumedh Sharma, Juan Sebastián Rincón Tabares, and Mohammad Syed, along with graduate students Daron Smith, Mohamed El Tahlawi, Sri Keerthana Chakravarthula, Ruturaj Chiddarwar, Daniel Martinez, and Zoheb Faisal. (PIs: Petros Sideris & Anand Puppala)

Their contributions reflect the strength and diversity of our ongoing research efforts.

Celebrating Excellence in Teaching and New Research Publication

Wonsuh Sung, a Graduate Assistant Lecturer in the Zachry Department of Civil and Environmental Engineering at Texas A&M University, was recently honored with the Excellence in Teaching Award. This recognition reflects his impactful work as a teaching assistant in the Fall 2024 semester, as the instructor for Mechanics of Materials in Spring 2025, where he taught 94 undergraduates. He extended his thanks to his advisors, Dr. Petros Sideris and Dr. Stephanie Paal, as well as to the students whose engagement and support made this milestone especially meaningful.

In addition, Wonsuh led a newly published study titled "Shear Capacity Prediction Model for Prestressed Concrete Beams via Data-Driven Methods," developed with student and faculty collaborators. The research introduces predictive models based on a dataset spanning 1954–2020, showcasing the department's strong research culture and collaboration.

CIR RESEARCHERS REPRESENT AT TRB 2025

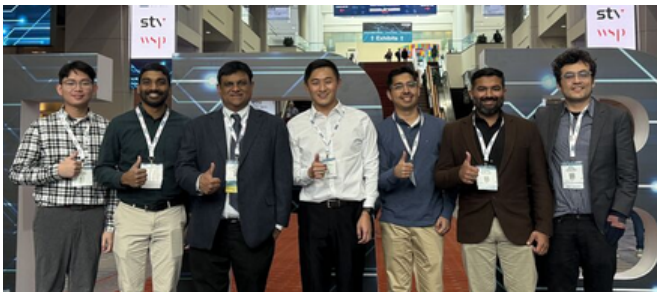
In January, multiple CIR-affiliated researchers and students proudly represented Texas A&M, TEES, and TTI at the Transportation Research Board (TRB) Annual Meeting in Washington, D.C. Their active participation underscores CIR's ongoing commitment to advancing transportation research and fostering academic collaboration on a national stage. We are proud of the dedication, professionalism, and innovation our team brings to this influential forum each year.

Showcasing Innovation in Soil Stabilization

Dr. Anand Puppala's Infrastructure group presented innovative research on soil stabilization, drawing attention from both academic and industry professionals.

Post Doctoral Researcher Dr. Jianxin Huang presented "Developing Preliminary Guidelines for Soil Stabilization Using Liquid Polymers." Aditya Deshmukh shared a case study titled "Lime Stabilization of Moisture-Susceptible Soil in Highway Embankment Slopes." Ph.D. students Muddassir Sanei and Sopharith Chou presented their work on "Utilizing Recycled Concrete Aggregate Fines as Co-Additives in Low-Carbon Cement for Problematic Soil Stabilization."

All three posters were well-received, earning praise for their innovation and presentation quality. CIR is proud to support our research students in advancing sustainable and practical solutions for geotechnical infrastructure challenges.



Advancing Sustainable Cement Research

Ph.D. candidates Ayazhan Bazarbekova and In Kyu Jeon presented their research at the 104th TRB Meeting under the guidance of their advisor, Dr. Yong-Rak Kim.

Bazarbekova presented "Examining the Effects of Biochar Characteristics on Early-age Hydration and Fresh Properties of Cement Paste" during a poster session and at a TRB committee meeting. Her work, a key deliverable of the NCIT project funded by the U.S. Department of Transportation, was supported by a Graduate Research and Presentation Travel Award from Texas A&M.

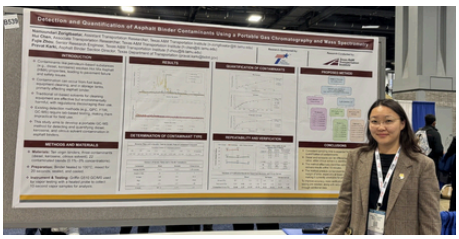
Jeon also presented research on sustainable cement-based materials and participated in the AKM50 committee meeting. His attendance was supported by the IBT/ABC-UTC project and KOTAA.

CIR is proud to support these emerging researchers and Dr. Kim's leadership in advancing sustainable infrastructure solutions.

Portable Detection of Asphalt Contaminants

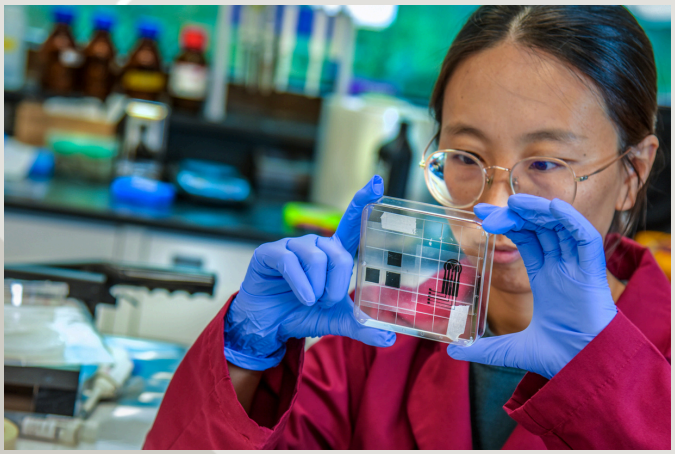
Namuundari Zorigtbaatar, TTI Assistant Transportation Researcher, presented her work "Detection and Quantification of Asphalt Binder Contaminants Using Portable Gas Chromatography and Mass Spectrometry."

The research focuses on detecting and measuring contaminants in asphalt binders using portable gas chromatography and mass spectrometry. This method helps identify harmful substances that could affect the quality and performance of asphalt materials.



Bridge Substructure Research

The TTI research team, Dr. Abhijit Mistri, Dr. Pravin Saraswatula, and PI Dr. Anol Mukhopadhyay, presented their work on evaluating protective coatings and sealers for bridge substructures at the TRB Annual Meeting 2025 (AKM90 Committee). The event provided valuable insights and networking opportunities, and the team extends special thanks to TxDOT for funding the project.



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