NATIONAL CENTER FOR ASPHALT TECHNOLOGY

ANNUAL REPORT 2024

National Center For Asphalt Technology
NCAT
AT AUBURN UNIVERSITY

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DIRECTOR'S MESSAGE

Looking back at what we accomplished in 2024, there's no doubt it was a very good year for the NCAT team. Highlights of the year include the Test Track Conference and starting the 9th cycle of research on the Test Track, completing numerous studies for a diverse list of clients and winning a great portfolio of new projects. Each of these accomplishments is a testament to the dedication of the fantastic NCAT team who really enjoy working with stakeholders across this great industry.

Capping off the year was the amazing NAPA Road Scholars campaign, which raised $3 million to support fellowships for NCAT's growing graduate student program and the opportunity to recognize three new inductees to the NCAT Wall of Honor. Please see related articles on these items on pages 11 and 15, respectively.

Feedback was terrific for the 8th Test Track Conference held on May 7-9, attended by more than 300 stakeholders. We presented findings from 25 experiments, which are documented in the Test Track report and updated the summary report titled NCAT Test Track 2000-2024 Research Findings. Our attention then turned to the 9th research cycle, featuring 17 new test sections and 20 continuation experiments. Nathan Moore, our newly minted Assistant Director for Test Track Research, did a fantastic job of orchestrating this incredibly complex construction operation.

In 2024, the hard-working NCAT team completed major research studies funded by NCHRP, FHWA, the Airfield Asphalt Pavement Technology Program (AAPTP), NAPA, the Alabama DOT, the Florida DOT and the Minnesota DOT. The deliverables from those studies are available from the respective sponsors. This year, the NCAT team also initiated five new NCHRP projects, two projects for NAPA and one project each funded by the National Road Research Alliance, AAPTP, the Florida DOT, the Wisconsin DOT, the Hawaii DOT and the New Mexico DOT.

Many of our recent and ongoing studies focus on evaluating innovative asphalt mixture additives with a common theme of improving pavement sustainability and durability. We are particularly enthusiastic about helping highway agencies and airports move technologies into field projects and routine practice. Two noteworthy field projects for which we provided essential support were the Balanced Mix Design field validation projects in Alabama and North Dakota.

I also want to mention the continued growth of NCAT's training program and outreach efforts. More than 1,300 individuals participated in NCAT training classes this year, more than 1,000 people attended NCAT webinars and the NCAT Training in Your Pocket videos garnered over 16,000 views. In 2024, we launched a new video series featuring our research staff covering implementable topics from our research. The audience metrics on primary social media platforms continue to grow at an accelerating pace, the Asphalt Technology News readership continues to grow and receive accolades and we welcomed a record number of visitors to our facilities this year.

If it's not obvious already, I am extremely proud of the 45 individuals that comprise the NCAT team. They are the reason for NCAT's successes. Please check out the feature on our newest team members and the leaders who were promoted to new positions on page 21.

My expectation is that our staff, our graduate student numbers, our research program and our outreach efforts will continue to grow in 2025. We've made good investments in our facilities and equipment to support the growth. We have backing from the University and the NCAT Board of Directors to add staffing as needed to meet our mission and strategic plan. We're excited about the opportunities ahead.

Randy C. West, Ph.D., P.E.
NCAT Director and Research Professor

CORE COMMITMENTS

MISSION

NCAT's mission is to provide innovative, relevant and implementable research, technology development and education that advances safe, durable and sustainable asphalt pavements.

VISION

NCAT will maintain its prominence as a world leader in asphalt pavement technology. Central to all its functions will be NCAT's historic partnerships with NAPA, state transportation departments, the FHWA and all stakeholders involved in the asphalt pavement industry. NCAT will continue to be recognized for the quality of its research, training, education and technology transfer. NCAT will ensure the quality of its programs through a careful focus of its resources with emphasis in areas of national and economic need.

VALUES

Provide for the well-being of team members and visitors by ensuring a culture of safety consciousness through our attitude and actions.

Provide an environment where all employees feel welcomed into an NCAT family that respects our differences and works together to accomplish the task at hand, where members have our full support and the value of the home family is recognized.

Conduct ourselves with integrity by acting with honesty and fairness without compromising the truth, cutting corners or adding intentional bias.

Conduct and pursue deployable and valuable research and technical services that result in positive change for agencies, innovation for industry and an improved traveling experience for the public.

STRATEGIC PLAN

OPERATIONAL EXCELLENCE

Build NCAT's reputation as the most operationally effective asphalt pavement research center, turning research dollars into implementable advances in asphalt pavements.

- Strengthen the culture of safety
- Build and develop staff with diverse capabilities and expertise to support NCAT's mission
- Continue to improve cost effectiveness and output of operations
- Seek and adapt to feedback from stakeholders
- Maintain existing and develop new long-term technical capabilities and advantages
- Serve clients' needs such that they will view NCAT as essential for technical support

OUTREACH & EDUCATION

Build NCAT's education and training capabilities to become the most knowledgeable and effective asphalt training center in the world.

- Work closely with allies and partners to support issues that benefit all organizations
- Assist all stakeholder organizations to implement high value research findings
- Expand training and outreach as an enhanced revenue stream
- Deliver high quality training on the most needed topics
- Adapt to the evolving training landscape to meet the growing demand for mobile delivery
- Grow the Auburn pavements and materials graduate and certificate programs

INNOVATION & INFLUENCE

Grow NCAT into the preeminent research center and technical advocate for the asphalt industry.

- Strengthen capabilities that differentiate NCAT from other asphalt research organizations
- Continue to build the NCAT Test Track's reputation as the world's best accelerated pavement testing facility and proving ground for evaluating innovative technologies
- Develop CAPRI as a means to better prioritize research needs and facilitate implementation
- Identify emerging research needs and quickly mobilize resources to initiate tasks that will enable future development and implementation
- Pursue commercialization revenue opportunities aligned with NCAT's mission
- Collaborate with Auburn and external researchers as needed to expand research
- Raise the visibility of NCAT and strengthen the ability to compete for federally funded research through the Auburn Transportation Research Institute

RESEARCH DRIVEN ///

Major research projects completed in 2024

$800,000

TFRS-01: Quality Assurance Aspects of Performance Related Specifications, Randy West

This study enhances pavement quality using Asphalt Mixture Performance-Related Specifications (AM-PRS) and three performance tests—dynamic modulus, cyclic fatigue and stress sweep rutting—to streamline evaluations and reduce testing time. It applies index-volumetrics and performance-volumetrics relationships to link volumetric parameters to pavement life, simplifying quality assurance. The project developed guides and performance criteria for DOTs to implement AM-PRS. It also assessed the impact of material variations and production methods on mixture performance.

$700,000

FHWA – Development of Aging-Resistant Binder Technologies, Nam Tran

This study evaluated five aging-resistant additives for asphalt binders to enhance pavement durability. The binders were tested under oxidative and UV aging to assess their rheological, chemical and mechanical properties. Results showed that the additives improved aging resistance and cracking performance, with effectiveness varying by additive and base binder. These findings suggest that selecting the appropriate additive can significantly extend the lifespan of asphalt pavements.

$333,718

NCHRP 9-65 (TTI) – Durability of High RBR Mixtures, Nam Tran

This study developed a framework to design durable asphalt mixtures with high recycled binder ratios (RBRs). It focused on optimizing recycled materials and additives while addressing durability issues like aging, moisture, and traffic loads. The project produced a draft Standard Practice for AASHTO, guiding agencies to maximize sustainability without compromising performance. The framework provides a practical approach to balancing environmental goals with the need for long-lasting, high-performance pavements.

$210,600

NAPA-AAPTP - Binder Selection Web Tool, Raquel Moraes

This study addressed the need for selecting the correct asphalt binder grade for airport pavements to ensure durability under aircraft loads, environmental conditions and daily operations. Recognizing the challenges engineers face in balancing performance and cost, NCAT, in partnership with AAPTP and WAP Sustainability Consulting, developed the Airfield Asphalt Binder Selection Tool. This online resource guides engineers in choosing binders based on factors such as climate, aircraft loading, pavement layers and regional binder availability. The tool streamlines decisions, cuts costs, prevents delays and enhances pavement performance.

$210,000

FDOT – OGFC for Suburban Environments, Nam Tran

This study investigated strategies to enhance the durability of OGFC on Florida's high-speed suburban roads, where premature raveling frequently occurs. The findings showed that using a finer 9.5 mm aggregate gradation, a high polymer-modified binder, and a lower air void design for the friction course significantly improve both durability and friction, while minimally compromising permeability. These strategies offer cost-effective solutions to extend pavement life and enhance safety. The results suggest that implementing these approaches could lead to reduced maintenance costs and improved road performance, benefiting both transportation agencies and road users in the long term.

$180,000

FDOT – Analysis of Defective Materials, Carolina Rodezno

This project evaluated FDOT's current practices and procedures to evaluate defective asphalt materials that fail to meet the criteria established for Superpave and friction course mixtures. Part one reviewed the long-term performance of pavement sections with defective materials to assess current FDOT practices. Part two consisted of a laboratory experiment designed to evaluate the department's current assessment procedures and included the Asphalt Pavement analyzer (APA), and the High-Temperature Indirect Tension Test (HT-IDT) for Superpave mixtures, and the Cantabro and permeability tests for friction course mixtures.

$166,665

ALDOT – Local Verification for Pavement ME, Nam Tran

This study verified the AASHTOWare™ Pavement ME Design models for flexible pavements under Alabama conditions. It utilized data from Long-Term Pavement Performance (LTPP) sections in Alabama and neighboring states, as well as sections from the NCAT Test Track. Significant biases in rutting, fatigue cracking, and smoothness predictions underscored the need for local calibration to enhance accuracy and reliability in pavement design. The findings emphasize the importance of incorporating regional variability in pavement design models to ensure more precise predictions and improve the performance and longevity of flexible pavements in Alabama and similar regions.

$160,500

ALDOT – Cracking Test Parameters, Nam Tran

This study assessed the cracking resistance of Alabama asphalt mixtures using the AL-CT_{index}. Over 450 laboratory and 38 plant mixtures were tested and analyzed to evaluate the impact of design parameters, components, and volumetric properties. The findings provide insights for incorporating a cracking test into specifications to improve asphalt mixture durability in Alabama. Refining mixture design practices and incorporating specific testing could lead to more durable pavements, reducing maintenance costs and extending the service life of roadways throughout the state.

$55,000

HDOT (Grace Pacific) – Recycled Plastic Pilot Project, Fan Yin

This study explored the use of recycled plastics for dry-process asphalt mixture modification for a pilot project in Hawaii. Two plastic additives, derived from discarded fishnets and local plastic waste collected across the Hawaiian Islands, were tested for performance evaluation using a suite of balanced mix design tests. The results revealed that all plastic-modified mixtures, regardless of the type of virgin binder and plastic additive used, exhibited comparable rutting, cracking and moisture resistance as the control mixture containing an SBS-modified binder. This shows the potential of locally sourced recycled plastics as a sustainable asphalt modifier without compromising performance.

$162,803

ALDOT – Maximum Asphalt Pavement Thickness Designs, Dave Timm

This study developed a framework and recommendations for determining the maximum thickness of asphalt concrete (AC) in a flexible pavement during structural pavement design and evaluation. . Using data from 44 pavement sections across Alabama, the research developed and validated a methodology incorporating perpetual pavement principles and climate considerations to ensure structural integrity without overdesign. Recommendations provided maximum AC thickness ranges for various conditions, accounting for subgrade quality, base layers and climate zones. This framework helps ALDOT cap pavement thickness, reducing costs while ensuring performance.

$80,000

NAPA - PCC Rehabilitation with Asphalt Overlays, Adriana Vargas

The use of asphalt overlays to rehabilitate PCC pavements is a common practice due to their lower cost and reduced construction time compared to other alternatives, such as concrete pavement restoration (CPR) techniques or concrete overlays. However, the long-term functional performance of these overlays can be hindered due to the potential for reflection cracking. Methods to mitigate this distress include slab fracturing, stress-relieving interlayers and crack-resistant asphalt mixes. Over the past three decades, significant advancements have improved these processes.

$18,999

NAPA - Comparative Life Cycle Assessments of Alternate Designs, Suri Gatiganti

This study used LCApave to evaluate the environmental impacts of alternate designs and bid (AD/AB) pavement projects in three states, comparing flexible and rigid pavements. Results showed rigid pavements have significantly higher impacts across key indicators like global warming potential and eutrophication potential. These findings highlight the importance of using life cycle assessments to guide sustainable pavement design and reduce the environmental footprint of transportation infrastructure. Tools like LCApave enable informed decisions that balance performance with sustainability.

RESEARCH DRIVEN ///

Largest new contracts awarded in 2024

$10,250,000	ALDOT: Accelerated Performance Testing on the 2024 NCAT Pavement Test Track with MnROAD Research Partnership
$1,712,363	MnDOT: National Partnership to Improve Quality of Preventative Maintenance Treatment Construction & Data Collection Practice
$750,000	Universal Matter: Phase II - Mixture Performance and Structural Capacity Characterization of Asphalt Pavement with Polymer Pellets
$750,000	Verde Resources: Structural Capacity of a Sustainable Asphalt Pavement Treated with Enzymes and Biochar
$400,000	NCHRP: Development of a Field Test to Determine Chip Seal Aggregate Embedment
$380,000	ODOT: Re-Evaluating Asphalt Rutting Test for Balanced Mix Design and Quality Assurance Acceptance
$330,000	NMDOT: Advancing High Rap Asphalt Mixtures Toward Pavement Sustainability and Net Zero Carbon Emissions
$300,000	MNDOT: Validation of Loose Mix Aging Procedures for Cracking Resistance Evaluation in Balanced Mix Design
$277,250	UNR/FHWA Prime: Development and Deployment of Innovative Asphalt Pavement Technologies

46 NEW CONTRACTS AWARDED IN 2024

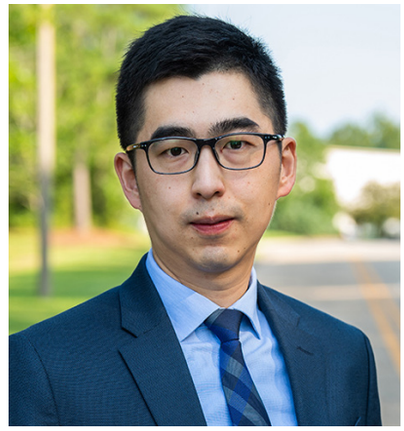
$19 MILLION TOTAL IN NEW AWARDS

$55 MILLION ACTIVE CONTRACTS

$250,000	CAPRI HDOT: Balance Mix Design Implementation Support
$250,000	CAPRI WisDOT: Directed Research Using HWTT CRD and IDEAL-RT for Rutting Evaluation of Asphalt Mixtures in Wisconsin
$250,000	WHRP: Investigation of Reflective Cracking in Wisconsin
$240,000	NDDOT: Climate Challenge for Reduction of Embodied Carbon in Bituminous Mixtures
$230,000	CAPRI KYDOT: Improving State-of-the-Practice for Friction-based Asphalt Mix Design
$190,000	Owens Corning: Balanced Mix Design and Environmental Benefits Of Asphalt Mixtures with Recycled Asphalt Shingles
$180,000	FLDOT: Evaluation of Reclaimed Asphalt Pavement (RAP) in FC-5 Mixtures
$160,000	Ergon Asphalt and Emulsions, Inc.: Evaluation of Asphalt Binder Additives for Use in Asphalt Mixtures with High Recycled Contents

STAFF ACHIEVEMENTS ///

NCAT Director **Randy West** delivered a guest lecture on the future of asphalt mix design as part of the Distinguished Lecture Series at Arizona State University's School of Sustainable Engineering and the Built Environment. He discussed Balanced Mix Design insights and highlighted progress, future developments and challenges in lab and field applications.



Associate Research Professor **Fan Yin** was appointed as the Deputy Chair of the RILEM (International Union of Laboratories and Experts in Construction Materials, Systems and Structures) Technical Committee: Alternative Paving Materials - Design and Performance, as well as Secretary of NAPA's Balanced Mix Design Implementation Working Group.

Associate Research Professor **Raquel Moraes** led the development of a new online tool and report, published under the AAPTP program, to assist engineers in selecting appropriate asphalt binders for airfield projects. This site is now available on the AAPTP website or directly at airfieldasphaltbinder.org

Dave Timm, Elton & Lois Huff Eminent Chair Professor**,** began serving as Chair of the Department of Civil & Environmental Engineering at Auburn University in July. He was also honored with the 2024 Eugene Skok Award from the National Road Research Alliance (NRRA) for his significant contributions to the U.S. pavement industry.

Ben Bowers, McCartney-Chase Highway Engineering Distinguished Professor in the Department of Civil and Environmental Engineering at Auburn University, earned a $167,631 grant from the Virginia Department of Transportation to study the resilience of full-depth reclamation pavement mixtures to flood inundation.

Associate Research Professor **Adriana Vargas-Nordcbeck** secured two national projects as principal investigator: the $1.7 million TPF-5(522) to improve pavement preservation practices and the $400,000 NCHRP 10-124 to develop a chip seal aggregate embedment test. She also joined the TRB Standing Committee on Pavement Maintenance (AKT30).

NCAT NEWS ///

Moore appointed assistant director for Test Track Research

Nathan Moore has been appointed to assistant director for test track research at the National Center for Asphalt Technology (NCAT). In this role, Moore will lead the test track research program, serving as the main contact for sponsor engagement and coordination with principal investigators. He will coordinate experimental planning, oversee the construction of test sections and supervise NCAT's Test Track operations staff.

Moore will also leverage NCAT's collective capabilities to present research proposals to potential clients to secure sponsor funding for future test track research.

"I am thrilled and honored to have this opportunity," said Moore. "We have an incredible team at NCAT and I am very excited to continue working alongside them in this new role."

Moore obtained his bachelor's and master's degrees in civil engineering from Auburn University and served as a co-op student and graduate research/teaching assistant at NCAT during his time there. He joined NCAT as an engineer in 2017 and is now pursuing a doctorate in civil engineering at Auburn. He is a registered Professional Engineer in the state of Alabama. Moore's academic and practical experience make him an asset in NCAT's research efforts.

"Moore has an outstanding exceptional technical background, along with a strong work ethic, humility and enthusiasm, all of which are essential for this role," said NCAT Director Randy West. "We look forward to witnessing the expansion of the test track research program under his leadership as he steers our efforts toward an exciting future of research excellence."

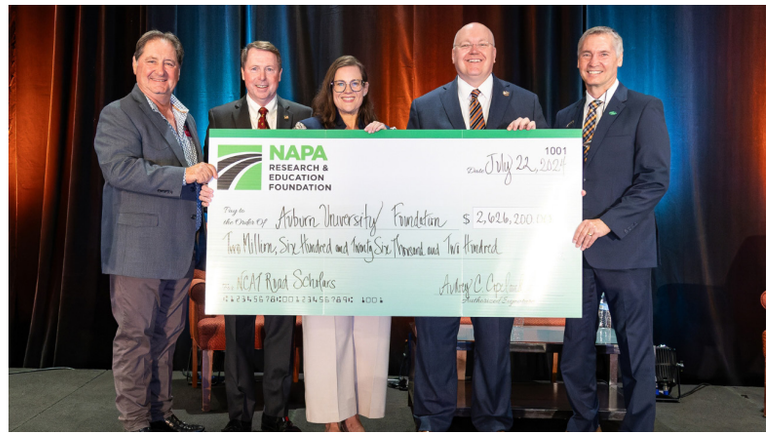
NCAT honored with NAPAREF Road Scholars endowment check

The National Center for Asphalt Technology (NCAT) at Auburn University was honored with a ceremonial check for the Road Scholars endowment from the National Asphalt Pavement Association Research and Education Foundation (NAPAREF) on Monday, July 22, marking NAPA's commitment to supporting Auburn University graduate students working with NCAT who are pursuing careers in pavement engineering.

The Road Scholars Program provides crucial resources and funding to help students gain hands-on experience and contribute to cutting-edge research. By developing future industry leaders, the Road Scholars Program helps secure a steady supply of skilled professionals equipped to address pavement design and infrastructure maintenance challenges.

NAPA and NAPAREF Chairmen Brady Meldrem and Jay Winford, along with NAPA President & CEO Audrey Copeland, presented the $2.6 million check to Auburn University President Chris Roberts and NCAT Director Randy West during the general session.

"The Road Scholars Program exemplifies the foundational partnership between the NAPA Research and Education Foundation and Auburn University, which began nearly 40 years ago with the establishment of NCAT," said President Roberts in his remarks following the check presentation. "This scholars program underscores our shared commitment to advancing asphalt research and education, providing essential resources and empowering the next generation of industry innovators and leaders."



Pictured left to right: Brady Meldrem, Jay Winford, Audrey Copeland, Chris Roberts and Randy West.

NCAT Test Track Conference showcases asphalt research

Dave Timm, chair of Civil and Environmental Engineering at Auburn University, presenting data to conference guests on a tour of the Test Track.

NCAT hosted its triennial Test Track Conference May 7-9 at the Auburn University Hotel and Conference Center. The event presented advancements in the design, construction, materials, maintenance and sustainability of asphalt pavements to more than 300 industry professionals.

Highlighting the latest findings from the 8th cycle of accelerated pavement testing conducted at NCAT's Test Track, situated just 20 minutes east of Auburn University, the conference offered insights into the forefront of asphalt pavement research and development.

Setting the Tone

"Research means nothing if we do not implement," remarked Richard Willis, National Asphalt Pavement Association's (NAPA) vice president of engineering, research and technology, setting the tone for the conference in his opening address. The conference encouraged participants to move beyond exploration and actively implement proven technologies, a sentiment that echoed throughout the event.

With attendees from across the country and beyond, including representatives from Hawaii, Peru, Puerto Rico and Saudi Arabia, the conference served as a platform for knowledge exchange and networking within the asphalt industry. Among the participants were research sponsors, public agencies, contractors, asphalt paving associations, FHWA and various other asphalt professionals.

Paving the Way

Throughout the conference, attendees explored a myriad of topics, spanning from mixture additives to innovative pavement design methodologies. Research engineers from NCAT delivered presentations on recycling agents, innovative mix additives, crack prevention interlayer strategies, high polymer binders, cold recycling, pavement preservation treatments and more.

Benjamin Bowers, assistant professor in the Department of Civil and Environmental Engineering at Auburn University and an NCAT researcher, presented information on cold recycling, balanced mix design and Life Cycle Assessments of asphalt pavements.

"This conference brings together all walks of asphalt-life, from agencies to industry, to hear about the research we've been conducting and discuss implementable outcomes," Bowers said. "I love that I now get to stand on stage as an Auburn University and NCAT representative to talk about the impactful work my team is doing for VDOT, TDOT, FHWA and our industry partners. I love the energy that the conference brings along with the community."

Test Track Tour

A highlight of the conference was the opportunity for participants to inspect the 1.7-mile Test Track, which features 46 200-foot test sections funded by highway agencies and industry sponsors.

This unique real-world laboratory allows researchers to collect and analyze field performance data, pavement responses and laboratory test results for plant-produced mixtures sampled during construction.

"Being able to see, in-person, how the test sections have performed makes the experiments more meaningful," said Randy West, director of NCAT. "Conference participants get to see the cracking, feel the textures of the surfaces and see open trenches of sections to observe how damage progresses, is part of the experience that makes this conference unique."

Road To Progress

Since its inception in 2000, the Test Track has been instrumental in assisting agencies in refining asphalt pavement specifications and shaping mix design policies. The research conducted at the test track continues to yield dividends for many agencies.

With its unique ability to simultaneously test multiple instrumented asphalt pavements under natural environmental conditions with accelerated loading, the Test Track stands as a beacon of innovation and excellence in asphalt research.

NCAT researchers present at the Test Track Conference. Pictured top, Fan Yin and Ben Bowers. Pictured below, Raquel Moraes and Randy West.

Three new inductees welcomed to NCAT Wall of Honor during annual Board of Directors meeting

NCAT's Board of DIrectors meets yearly to discuss the center's strategic initiatives, review ongoing research projects and identify opportunities to advance innovation and sustainability in the asphalt pavement industry.

The NCAT Board of Directors is composed of industry leaders and academic experts, including Chairman Brian Enders, Vice Chairman Mario Eden, Audrey Copeland, Ray Brown, Carolina Cavalcante, Allan David, Chris Doan, Heather Dylla, Tim McCartney, Amanda Mohr, Larry Rilett, David Timm and Ryan Yoch. Their collective expertise and guidance continue to play a pivotal role in shaping NCAT's mission.

During the meeting, three influential leaders were inducted into the NCAT Wall of Honor for their contributions to NCAT and the asphalt industry.

This year's inductees are Ron Sines, vice president of sustainability and decarbonization with CRH Americas Materials Inc.; Jay Winford, president of Prairie Contractors; and Christopher Roberts, president of Auburn University. Their previous contributions and ongoing work with NCAT have played a crucial role in the center's growth and continued success.

Established in 2011, the NCAT Wall of Honor is a permanent display at NCAT's main facility in Auburn that recognizes its founders and key figures who have played an important role in supporting the center's mission of sharing asphalt research, education and information worldwide.

"The exceptional support that these three leaders have given to NCAT has helped our team of researchers and instructors succeed in meeting the center's mission," said Randy West, director of NCAT. "We are proud to recognize them in a way that allows everyone visiting our lab and training center to see and learn about their contributions to our success."

The three inductees were honored with a permanent plaque on the Wall of Honor and a commemorative replica to take home in a ceremony on November 19 at NCAT's facility.

Highlights from the reception at the 2024 Board of Directors meeting.

James “Jay” Winford Jr.

Winford served as National Asphalt Pavement Association’s (NAPA) chairman from 2020-21 and has been a member of the NCAT Board of Directors since 2005, including a term as chair from 2012-16. He has made notable contributions to the asphalt industry through his service with NAPA and NCAT. Under his leadership, NCAT experienced tremendous growth and development for the industry’s future, including the Road Scholars endowment campaign in 2024, which raised $3 million for graduate student fellowships. Winford holds a Ph.D. in civil engineering with a concentration in pavements and materials from Auburn University.

Christopher B. Roberts

Roberts served as vice chair of the NCAT Board of Directors from 2012-22 and was vital in renewing the NCAT agreement with the NAPA Research and Education Foundation (NAPAREF) in 2020. During his tenure as dean of the Samuel Ginn College of Engineering, he facilitated the transfer of ownership of the NCAT main office and laboratory to Auburn University, ensuring the center’s growth. As Auburn University’s president, he has strengthened the relationship between NCAT and key industry stakeholders, enhancing collaboration for further asphalt research.

Ron Sines

Sines began his service on the NCAT Board of Directors in 2010 and served as chair from 2017-23. During his tenure, he led the update of NCAT’s strategic plan to ensure alignment with the changing needs of the asphalt industry. In addition to his board service, he has chaired the NCAT Applications Steering Committee, providing technical guidance for research, training and outreach initiatives. Sines’ leadership in developing NAPA’s Road Forward program brought sustainability into the mainstream of asphalt pavement research.

A new era of research begins with 9th Test Track cycle

Benjamin Bowers (left), associate professor in Auburn University's Department of Civil and Environmental Engineering and graduate student Ben Prowell (right) observe a sponsored section under construction during the 9th Test Track cycle.

A unique research asset that NCAT has is its Test Track, the only high-speed, full-scale accelerated pavement testing facility in the U.S. and one of only two in the world. This facility develops and tests innovative road-surfacing methods and groundbreaking experimentation conducted by engineers, researchers and students, allowing for the simulation of 6-8 years of heavy interstate-level traffic in two years, all without risking failures on public roads.

Following a successful reconstruction over the summer, the track has entered its 9th cycle of accelerated pavement testing, running from 2024 to 2027, continuing NCAT's mission to develop innovative and practical solutions for asphalt pavement performance on local, state and national roadways.

Built in 2000 and located 30 minutes from Auburn's campus, the 1.7-mile oval is comprised of 46 experimental test sections sponsored cooperatively by highway agencies and private industry on a three-year cycle. Throughout each cycle, loaded trucks generate 10 million equivalent single axle loads (ESALs) on the track. Since operations began in 2000, the trucks have accumulated enough mileage to circle the Earth 440 times.

"High-risk experiments can be conducted here without putting the traveling public at risk on open roads," said Test Track manager Jason Nelson. "We are creating tests and specifications to design more sustainable pavements that incorporate high levels of recycled materials. States can integrate these tests into their design procedures to assess road performance, resulting in improved roads for drivers nationwide."

A wireless network facilitates high-speed data transmission from test sections equipped with strain gauges and pressure plates to track pavement responses. This data informs comparisons across sections and helps refine pavement performance models. Forensic analyses identify causes of any distress at the cycle's end, leading to reconstruction or further evaluation in the next cycle.

Chen Chen, assistant research professor at NCAT, examining asphalt on a newly constructed section at the Test Track during construction.

Focus areas in the new research cycle

Highlights from the construction of NCAT's 9th research cycle on the 1.7-mile Test Track.

For eight cycles, NCAT has tested innovative materials and helped refine existing specifications and pavement design procedures for a more sustainable highway network. The 9th research cycle continues this trend, featuring cutting-edge experiments that enhance asphalt pavements' durability, safety and sustainability. Key areas of focus for this cycle include:

- **Cold Central Plant Recycling (CCPR):** This cycle includes new CCPR test sections, including one which re-recycled a previously placed CCPR section. Other CCPR sections feature the use of rejuvenators, including soybean-based rejuvenators from SoyLei Innovative Products and an engineering rejuvenating emulsion from Collaborative Aggregates.
- **Asphalt Mixture Additives:** This cycle has sections that test the performance of asphalt mixtures enhanced with recycled plastics, ground tire rubber (GTR), aramid fibers and graphene-enhanced additives.
- **Friction and Texture:** Several sections focus on improving pavement friction and texture, with sponsors investigating innovative asphalt mixtures and surface treatments designed to enhance surface characteristics.
- **Soil Stabilization:** A unique experiment in this cycle explores the use of enzyme treatments to stabilize expansive subgrade soils, reducing the need for traditional stabilizing agents like cement and lime.
- **Sustainability:** Various sections feature sustainable materials, such as high-recycled-content asphalt mixes and spray-on rejuvenators. Sponsors use the track to evaluate innovative methods to extend pavement life while reducing environmental impact.
- **Durability and Performance:** Multiple sponsors are focusing on improving the performance and longevity of asphalt pavements by evaluating new binder grades, mix types and innovative design approaches.

STUDENT FOCUS ///

By the numbers

National Rankings

Samuel Ginn College of Engineering and Auburn University

1st

Best university ranking among Alabama universities[1]

30th

Engineering undergraduate program ranking among public universities[1]

34th

Civil Engineering program ranking among public universities[1]

37th

Engineering graduate program ranking among public universities[1]

5th

Online Engineering program ranking among public universities[1]

11%

Top percentage of research institutions by total research and development expenditures [3]

95%

First-year student retention rate among public universities[1]

1st

Happiest students ranking among public universities[2]

82%

Six-year graduation rate among public universities[1]

[1]U.S. News & World Report [2]The Princeton Review [3]Higher Education Research and Development Survey

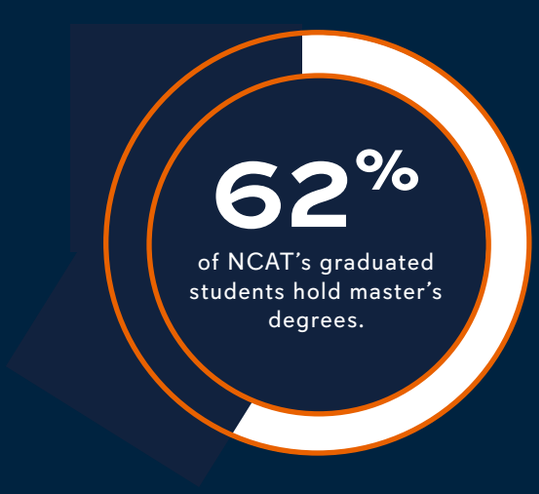
GRADUATE PROGRAM ///

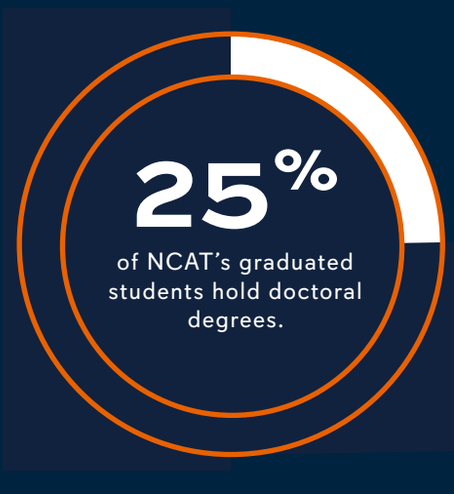
Pavement and Materials Engineering

Auburn's pavement and materials engineering program offers master's and doctoral degrees with a focus on advancing paving materials, construction, maintenance and design. Students gain hands-on experience through projects funded by state DOTs, FHWA and private corporations, conducted at the NCAT lab and Test Track. Courses cover various topics and prepare students to lead in infrastructure engineering.

Graduate Student
Overview

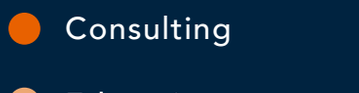
Since 1989, NCAT has developed 143 graduate students, with a total of 88 master's and 36 doctoral degrees. Our students are trained on cutting-edge technologies and graduate ready to apply their skills in various industries. NCAT currently has 14 doctoral students, seven of whom earned their master's degrees at Auburn University while conducting research at the center.

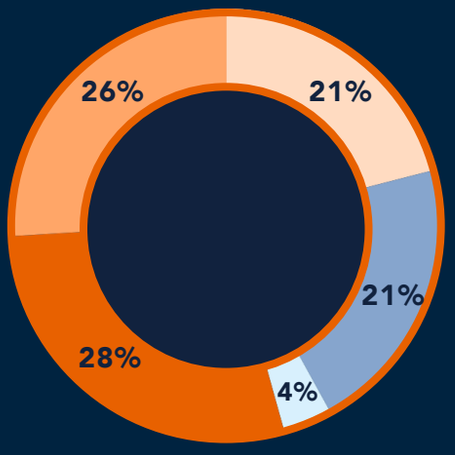




Employment by Industry

Many of our students have pursued careers with contractors, DOTs and material suppliers in the asphalt industry, using the real-world experience gained at our research and testing facility.





TRAINING THE WORKFORCE ///

NCAT's training program continues to play a vital role in supporting the asphalt industry by offering a variety of educational opportunities, including asphalt technician certifications, specialized courses and workshops that address both local and global industry needs. Learn more about NCAT's courses at ***NCAT.us/education***.

64 COURSES

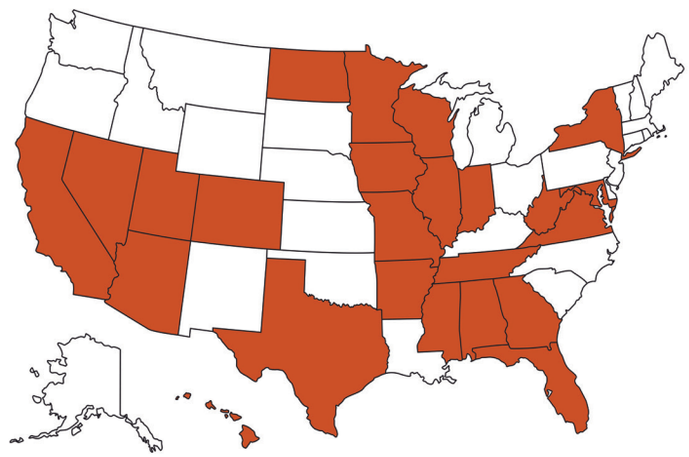
1,365 ATTENDEES

25 STATES

7 COUNTRIES

Nationwide and Global Impact

NCAT faculty and researchers travel frequently to present and teach at conferences, meetings, workshops, courses and other events. In FY 2024, NCAT's team visited more than 20 states and seven countries, including Canada, Portugal, Panama, Brazil, Saudi Arabia, Taiwan and South Africa, sharing their expertise and advancing industry knowledge on a global scale. Their extensive outreach demonstrates NCAT's commitment to promoting innovation and collaboration in asphalt pavement research and education worldwide.



NCAT

TRAINING IN YOUR POCKET

Video Training Outreach

16,311 VIEWS

1,315 SUBSCRIBERS

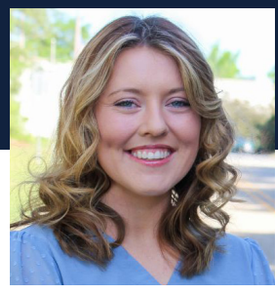
Training in Your Pocket is a series of short videos that presents asphalt topics and training methods in a quick, easy-to-understand format. Watch videos and subscribe to the channel by visiting: ***Youtube.com/TrainingInYourPocket***

STAFF UPDATES ///

NCAT expanded its team in 2024 with the addition of three assistant research engineers, each bringing a wealth of expertise in areas such as asphalt materials and balanced mix design. In addition to these new hires, several staff members received promotions, reflecting the ongoing growth and development at the center.

NEW ADDITIONS

ZANE HARTZOG
ASSISTANT RESEARCH ENGINEER



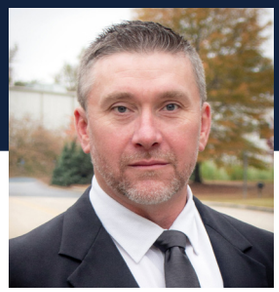
SAMANTHA DIXON
ASSISTANT RESEARCH ENGINEER

GRAHAM HURLEY
ASSISTANT RESEARCH ENGINEER

DEMETRIUS HARPER
TRUCKING SUPERVISOR

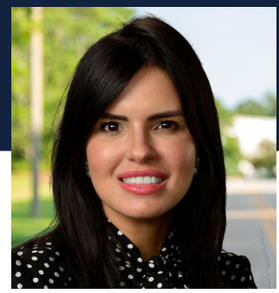
ALLISON KILLINGSWORTH
COMMUNICATIONS AND MARKETING SPECIALIST

PROMOTIONS



TRAVIS WALBECK
ASSISTANT DIRECTOR, TRAINING AND OUTREACH

JASON MOORE
ASSISTANT DIRECTOR, NCAT LAB RESEARCH



RAQUEL MORAES
ASSOCIATE RESEARCH PROFESSOR

CHEN CHEN
ASSISTANT RESEARCH PROFESSOR

SURI GATIGANTI
ASSISTANT RESEARCH PROFESSOR

COMMUNICATIONS REACH ///

Cross-Network Performance

Social Media Summary

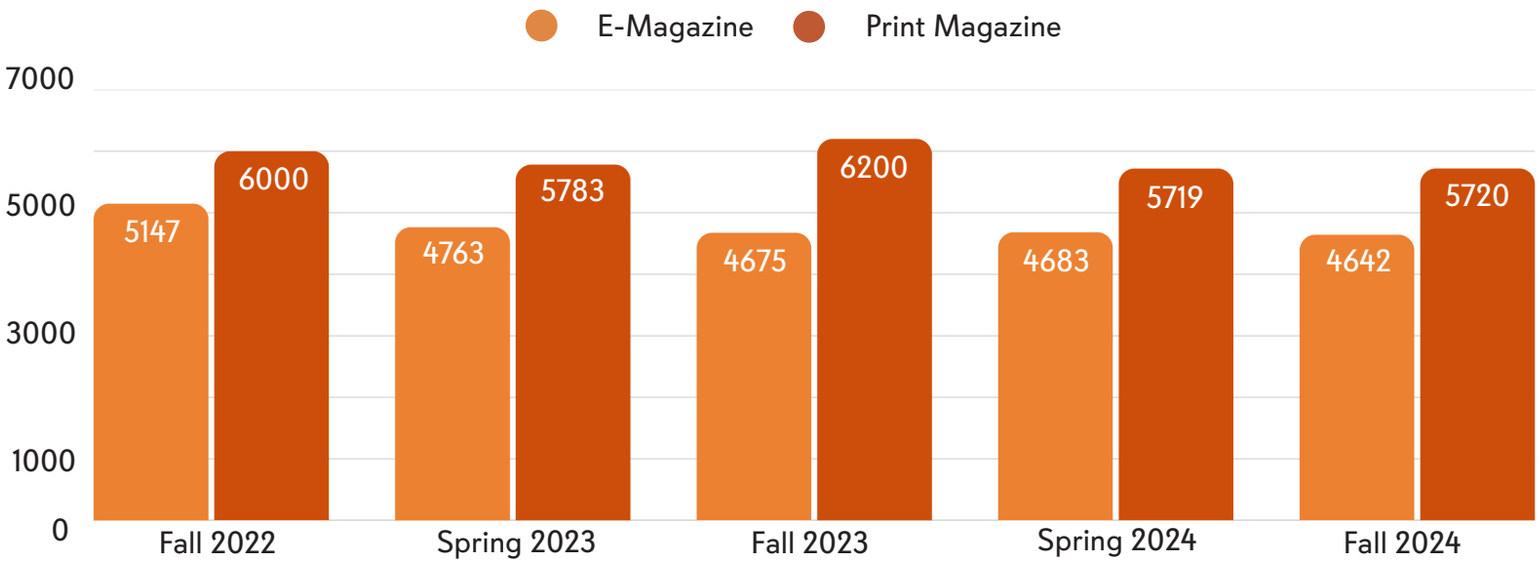
A cross-network performance summary provides an overview of key metrics across all social media platforms, offering full content performance and audience interaction data. Metrics include engagements (likes, comments and shares), impressions (the number of times posts are displayed on users' screens) and post link clicks (how often users click links within posts). The numbers below reflect NCAT's social channels from October 1, 2023 to September 20, 2024 compared to the previous fiscal year, showcasing year-over-year growth, trends and variations.

ENGAGEMENTS	IMPRESSIONS	LINK CLICKS	FOLLOWERS
29,724	284,383	18,487	12,335
↗2,438.3%	↗934.8%	↗17,177.6%	↗34.88%

Owned Media Performance

Publication Distribution

NCAT's biannual magazine, ***Asphalt Technology News***, offers valuable, ready-to-use information on timely topics and provides a dedicated forum for industry professionals to share insights and stay informed.



Website Traffic

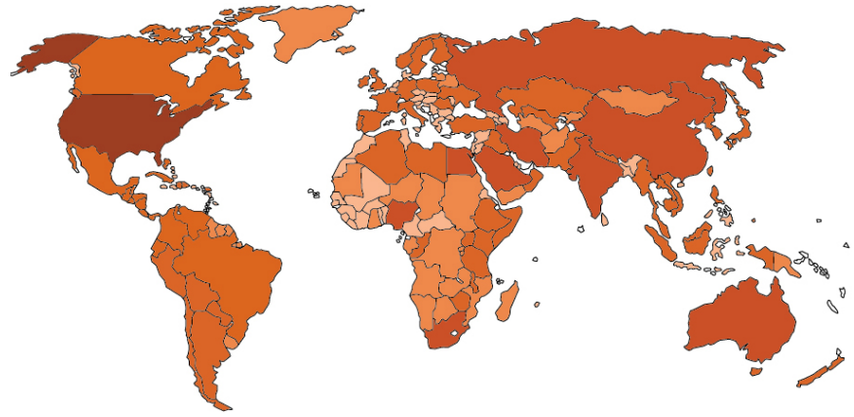
Top visitors by country

45,971
United States

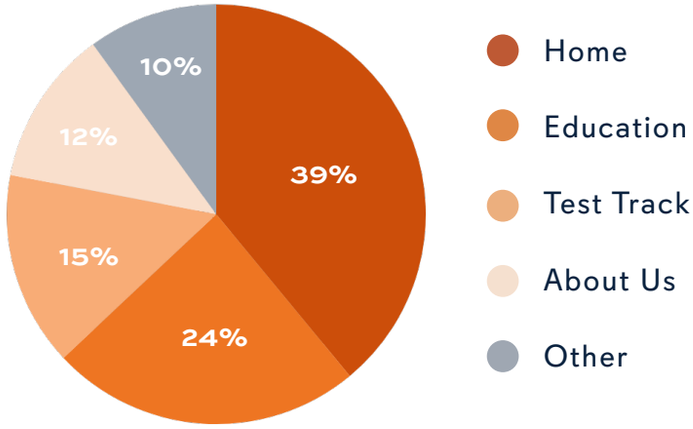
1,184
India

1,726
China

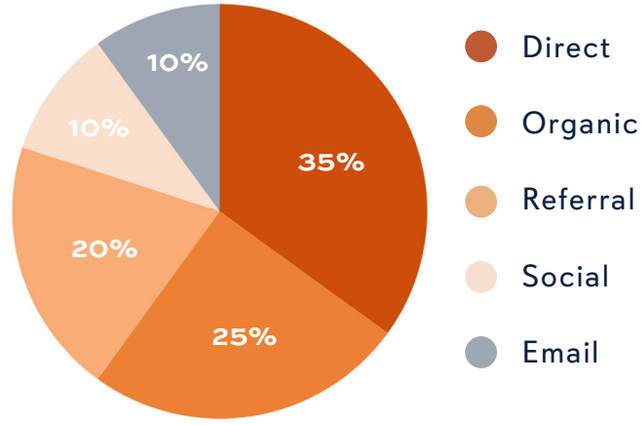
1,124
Germany



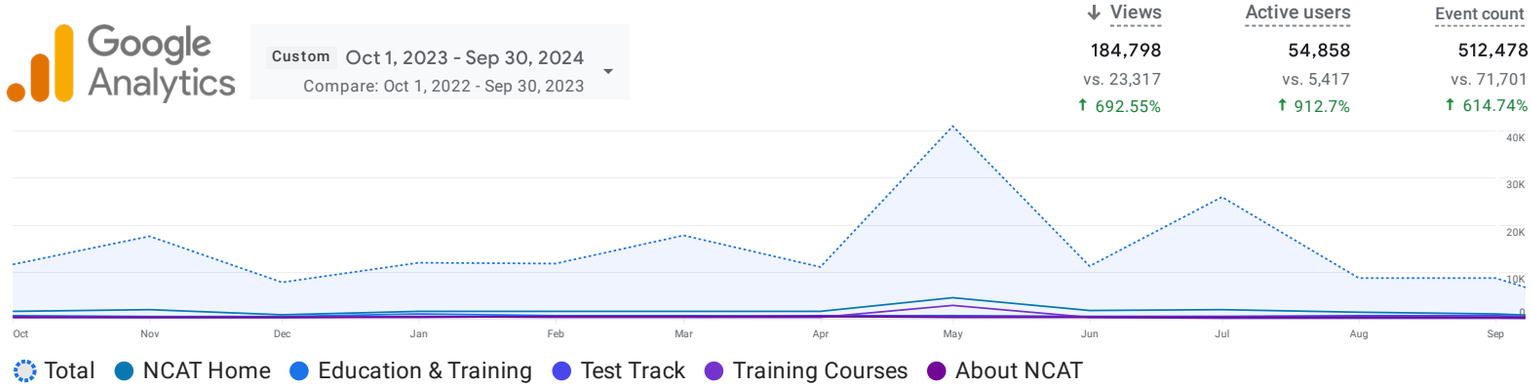
Unique page views



Acquisition



Monthly views



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ANNUAL REPORT 2024

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