

# A Lasting Legacy:

## Research Center Continues to Thrive After 20-Plus Years

By Nadia M. Whitehead • Photos by Laura Trejo

**S**ohail Nazarian, Ph.D., had big dreams when he started a transportation-focused center at The University of Texas at El Paso.

"We were to start off small and very concentrated," said Nazarian, reflecting back on 1993, the year that he and Miguel Picornell, Ph.D., founded UTEP's Center for Transportation Infrastructure Systems (CTIS). "But the goal was to slowly build ourselves up by expanding our scope and strengthening our research. At the same time, we wanted to remain dedicated to our students."

Twenty-two years later, it's safe to say the dream has blossomed.

CTIS consistently brings in \$2 million of research funding a year for projects related to pavements, railroad tracks, tunnels, bridges and highway safety. A playful advertisement mimicking Uncle Sam's famous poster "I want you for the U.S. Army" calls UTEP undergraduates to action, encouraging them to get involved with this research. That

approachable demeanor has made CTIS a hit with young engineers; the center supports and trains as many as 50 students at a time to assist with its hefty stack of research projects.

CTIS laboratories are equipped with modern soil, pavement and geotechnical testing equipment for conducting advanced dynamic and static laboratory tests.

"I always tell people that we have the best facilities between College Station and Phoenix," Nazarian said.

In 2014, the center received its biggest national recognition yet – it was chosen by the U.S. government as the only research center in the country to be a member of both a national and regional university transportation center. The designation means CTIS is capable of tackling research related to national and regional transportation infrastructure.

"This is one of the longest-standing centers at UTEP that demonstrates a consistent level of success year after year," said Cesar Carrasco, Ph.D., chair of the Department of

Civil Engineering. "A lot of times, centers pop up and then disappear, but this one has been sustained for more than 20 years."

CTIS' success can be attributed to a number of things – good leadership, innovative faculty – but its influential research and the impact it has on budding engineers may be key.

### Research that Counts

Its national and international reputation and CTIS' faculty experience in transportation, specifically in the area of pavements and nondestructive testing, is a major reason why the center has maintained its long standing.

In his early career, Nazarian and his partners at UTEP developed the Portable Seismic Pavement Analyzer (PSPA), a handheld device used to obtain the properties of concrete and asphalt pavements in a matter of seconds. The PSPA technology received a Top 10 Research Innovation award from the Texas Department of Transportation and its patent is owned by UTEP.

Nazarian's research efforts have supported six full-time research engineers and produced more than 80 graduates to date.

One of his recent projects involved evaluating new roadway technology for the Federal Highway Administration (FHWA).

Highway pavement evaluations are normally conducted at night so traffic won't be stalled. Bright orange cones pop up after sunset to protect engineers as they evaluate the health of some of the country's busiest roadways.

Nazarian's team looked at equipment that could be used without impeding traffic.

"Along with other partners, we spent time evaluating a special vehicle with lasers that analyzes the road's health as it drives," Nazarian said. "The U.S. government is interested in this technology, but they wanted someone to evaluate its effectiveness first."

By driving at the same speed as traffic, the vehicle doesn't hinder traffic flow and keeps workers safe. But best of all, it works. The study found the vehicle was quite effective at highway speeds.

CTIS submitted their findings and recommendations to the FHWA. The decision of the technology's uptake now rests in FHWA's hands.



CTIS consistently brings in \$2 million of research funding a year and is able to support and train as many as 50 students at a time. Together, students and faculty conduct research related to pavements, railroad tracks, tunnels, bridges and highway safety. Photo by Laura Trejo.

employers after she graduated. Jurado is now a pavement and materials engineer working for the FHWA. She oversees the state of Colorado's highway division.

Haggerty, who now is San Antonio's district materials and pavement engineer, oversees a staff of 17.

"Now that I'm a supervisor making hiring decisions, I see how competitive it is out there," said Haggerty, who holds a B.S. in industrial engineering and M.S. in civil engineering from UTEP. "I look for people with more than a degree, but practical experience. CTIS gives students that opportunity."

Both Jurado and Haggerty worked within CTIS as student researchers, but they did more than assist with studies. They took field trips to the Texas Department of Transportation, networked during FHWA conferences and visited potential employers like Jobe and Cemex.

Faculty like Nazarian and Imad Abdallah, Ph.D., associate director of CTIS, continue to provide mentorship to the two alumni who say

the professors are some of the smartest people they have ever met.

After graduating, Jurado and Haggerty didn't just disappear and move on with their lives, even though they live across the country. They frequently come back to visit campus and share big life events like wedding dates and new little family members.

"I really do owe a lot to the center," Jurado said. "There's a real sense of camaraderie in CTIS, so much so that I still have a good relationship with everyone there; you can't find that just anywhere." ❏

Other UTEP faculty who significantly contribute to transportation-related research are Vivek Tandon, Ph.D., associate professor of civil engineering; Reza Ashtiani, Ph.D., assistant professor of civil engineering; and Ruey "Kelvin" Cheu, Ph.D., associate professor of civil engineering.

Carlos Chang, Ph.D., associate professor of civil engineering, also burrowed into his fair share of CTIS research over the years. He currently studies the consequences of delaying highway maintenance, including its impact on users and the physical condition of highway assets.

Budget constraints often delay road maintenance and lead to transportation infrastructure deterioration. Chang likens this to preventive medicine gone awry.

"If someone wants to be in good condition when they're 80 years old, they don't start taking care of themselves when they are in their 70s; by then, it's too late."

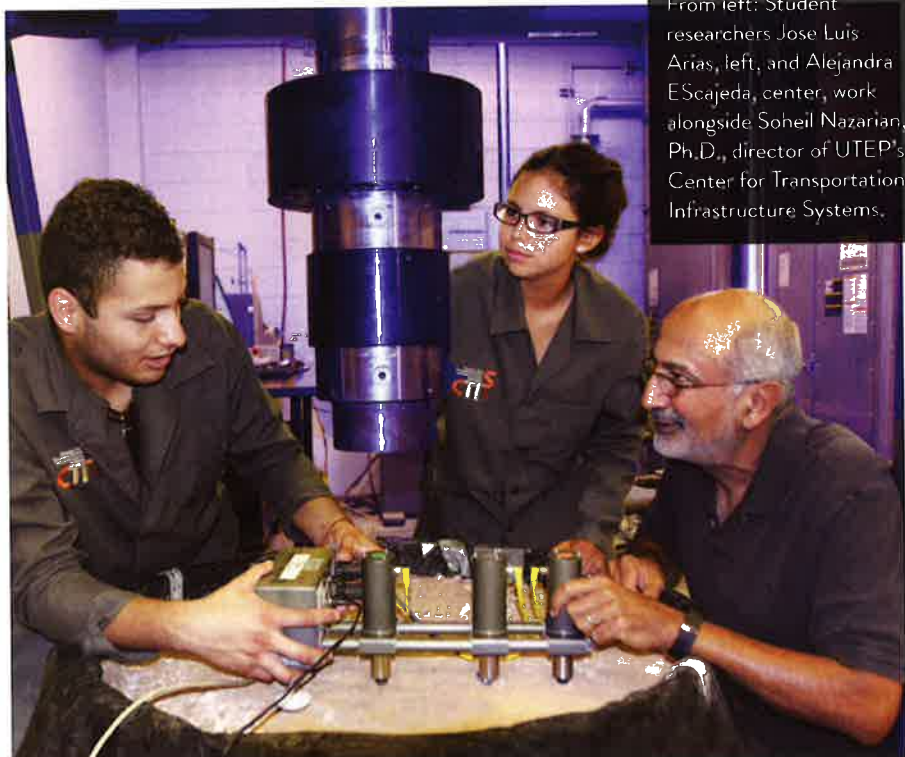
Chang's study will quantify the impacts of neglecting infrastructure, like weakening bridges and increased vehicle emissions, to help highway agencies make better decisions. Transportation agencies could improve their road regulations based on CTIS' findings.

### Student Success

Undergraduates involved in this research come out ahead when they graduate. UTEP engineering alumni Monica Jurado and Brett Haggerty can attest to that.

"CTIS opened several doors for me," said Jurado, who holds a B.S. and M.S. in civil engineering from UTEP. "Books don't teach you everything, so what I learned in the classroom, I got to carry out and perform in the lab."

That hands-on experience impressed



From left: Student researchers Jose Luis Arias, left, and Alejandra EScajeda, center, work alongside Soheil Nazarian, Ph.D., director of UTEP's Center for Transportation Infrastructure Systems.

COLLEGE OF ENGINEERING.UTEP/MAGAZINE

# ENGINEERING

THE UNIVERSITY OF TEXAS AT EL PASO

