Bahia to head highway research program

Associate Professor Hussain Bahia has been named the new technical director of the Wisconsin Highway Research Program. He takes over for Professor Peter Bosscher, who had directed the program since its inception in 1998.

The Wisconsin Highway Research Program is intended to integrate highway research efforts of the Wisconsin Department of Transportation, academia and industry representatives to strategically improve Wisconsin’s highways and transportation system.

Bahia has been a member of the College of Engineering faculty since 1996, and has served as principal or co-principal investigator on several Wisconsin Department of Transportation research projects, in addition to research sponsored by private industry. He currently teaches and conducts research in the area of pavement materials and design. His research group specializes in the area of modified asphalts, durability of asphalts, and compaction and rheology of asphalt mixtures.

He has published more than 50 peer-reviewed articles in technical publications on paving materials and performance. He has also served as a consultant to companies and agencies in Europe, South America, the Middle East and South Africa. He is a member of the Association of Asphalt Paving Technologists, the American Society of Civil Engineers, the Society of Rheology, and the American Society for Testing and Materials. He also has served on the Federal Highway Administration’s Expert Task Group on asphalt binders since 1993. He is an associate editor of the International Journal of Road Materials and Pavement Design.

Associate Professor Jamie Schauer’s research on air pollutants is at the forefront of national and international efforts to assess air quality and its impact on everyday life. Schauer, with a background in both chemical and environmental engineering, conducts analyses that measure air pollutants and their chemical properties and reactions. His research efforts stretch from Devil’s Lake in central Wisconsin to China and the Middle East.

“My research covers a broad spectrum,” Schauer said from his office near Memorial Union, overlooking Lake Mendota, “ranging from climate changes to impacts on human health. We measure the chemical composition of air pollutants to see where it comes from and to assess their impact.”

Air pollutant research has global reach

Schauer’s work has won him national recognition. Two years ago, he was named the Walter A. Rosenblith Young Investigator of the Year by the Boston-based Health Effects Institute, which studies the impact of air pollution. The award financed some of Schauer’s continuing work on air quality.

Schauer stresses that his research focuses on the front end of air pollution—what it’s comprised of, how it’s disseminated, and its impact on both humans and the environment. The goal of the research is to gain an understanding of air pollutants so that public policy makers can make better-informed judgments about air quality issues. His work meshes with air quality standards promulgated by agencies such as the federal Environmental Protection Agency and the state DNR.

For instance, the EPA in 1997 issued new standards regarding particulate matter in the air. Schauer’s research has led to a better understanding of how particulate matters contribute to air pollution not only in urban areas such as Milwaukee and St. Louis, but also areas such as Wisconsin’s Devil’s Lake State Park and Yellowstone National Park in Wyoming and Montana.

Schauer’s work is particularly relevant for Wisconsin, as the state must develop strategies to meet new EPA regulations for fine particulate matter in metropolitan areas including Milwaukee. The EPA requires state and local governments to achieve air quality standards for microscopic soot that is emitted from power plants, vehicles and other sources of air pollution.

Part of the difficulty in assessing local air quality is determining the sources of air pollution, since air pollutants can travel great distances before impacting an area. So Schauer and his team of researchers spend months or even years at a given site, assessing air pollutants over a long period of time to determine their origin.

“A key question is what fraction of the pollution is from local sources and what fraction is associated with regional sources—our methods help identify these sources,” he said. “Good public policy relies on understanding what emissions reductions are possible to improve air quality.”
MESSAGE FROM THE CHAIR

I am writing to you as the new department chair. It is hard to believe that I have been on the faculty for 16 years. Time flies when you’re having fun! It is a real honor to serve in this role, and I am following in the footsteps of a strong legacy of committed leaders. Professor Erhard Joeres stepped down as chair after serving for five years and being on the faculty for 33 years. We are indebted to him for all his help in shaping the department.

The bottom line for my desire to be chair grows out of my belief that the world is changing very rapidly. We must prepare our students for tomorrow—not the world as we know it today. As chair, I intend to help the CEE department respond rapidly to a changing world and a changing profession.

At the end of August, our faculty held a strategic planning meeting. With the help of alumnus Norm Doll, we were able to secure a professional facilitator who helped us apply best practices used by leading companies. Looking outside the department and university for help was a significant milestone for the faculty. The facilitator did a wonderful job keeping us focused and on task. As we tried to dodge issues, the facilitator would expose limitations in our thinking and views, as well as help amplify the issues and opportunities we were trying to articulate. It was a healthy and challenging exchange and experience.

Specifically, we looked at the changing environment for professional practice, strategic opportunities for CEE, the vision of the department in 2014, and strategic initiatives. Through this process we have identified seven strategic initiatives: effective governance, improved undergraduate curriculum, financial stability, increased diversity, strengthened reputation, organizational research plan, and efficient administrative processes. (See website at www.engr.wisc.edu/cee to download the plan.) We have developed action plans for the first three initiatives and are already working on them. We will be meeting again in mid-January to measure our progress and work through the other four initiatives.

Now the real work begins—taking action, being flexible, and being willing to experiment with new ideas and approaches to education, research and administration. It is not going to be easy, but we have to work to create our own vision of the department, and not be reactive to what is dealt to us.

For us to be effective, we need your help. We need to expand our base of stakeholders. We need to engage our alumni and industry partners in helping us get better in all facets of our department (undergraduate and graduate education, research, and public service). For example, we are in need of expanding the industry mentors to help in our senior level capstone design class offered every semester.

We are in need to proactively recruit students to our department. This includes aggressively pursing a more diverse student body. We must reach gender equity in CEE in the next 10 years if we are to attract the intellectual capital that the profession needs. Relative to ethnicity, we have a long way to go to shape ourselves into a leading department in the 21st century. We know we need to do something; we do not need a committee to study this. We need to yoke up with our alumni and industry partners and move to action and implementation.

Overall, we need to revive the BIG RED pride in our department. We are stoking up the pride by creating opportunities to interact with alumni and industry partners via our recent golf outing and receptions in Janesville, Milwaukee, Madison, and Minneapolis/St. Paul. We also hosted a reception for the parents of our students on November 6. If you have other ideas of how we can generate interest in our department and activities, please let us know!

Please do not be shy. Stop and visit us, send us a note and tell us about any fond memories you have of the UW, forward the names of possible students we can recruit, suggest ideas in which we can diversity our student body, and if possible, consider being a mentor for our students.

On Wisconsin,
Respectfully Yours,

Jeffrey S. Russell, Ph.D., P.E., F.I., ASCE
Civil and Environment Engineering student Evan Parks went to Rwanda this past summer thinking he would help install a reliable water system. The trip ended up changing his life.

Parks, a senior majoring in geology engineering, went to the strife-ridden African country as part of UW-Madison's Engineers Without Borders program. The EWB program, populated largely by engineering students, seeks to create sustainable engineering projects in impoverished areas both in the United States and abroad.

Parks got involved with the UW-Madison EWB chapter last year, and took interest in its Rwandan projects. The country has been torn apart by a civil war, and is one of the poorest of African countries. According to Civil and Environmental Engineering Professor Peter Bosscher, who advises the campus EWB chapter, Rwanda it has little working infrastructure, and basic necessities like clean water and sewage systems are lacking in much of the country.

Because the country is so poor, communities have to rely on rudimentary water systems. Villagers are often forced to walk several miles to obtain water if their local system breaks down, and often that water is untreated, Parks said.

The UW-Madison EWB chapter focused its efforts on the Muramba Deanery, an area of about 300,000 people served by four churches of the Muramba Parish. Muramba is one of the poorest areas of Rwanda, according to Bosscher, and has received little government assistance in building up its basic infrastructure system.

Nine members of the UW-Madison EWB chapter, along with Bosscher, traveled to Muramba in June to work on local projects for two weeks. The group of students worked on improving a gravity-fed water system that supplies much of the water for Muramba. Because of the country's extremely mountainous terrain, it's difficult to build centralized water systems, Parks said. So drinking water has to be found and delivered locally.

"It's a difficult work environment," he said. "They don't have basic infrastructure like we think of it. We like to compartmentalize as engineers. In Rwanda, it's all the same problem."

In addition to working on the gravity-fed water system, the group of students have worked with Muramba residents to encourage them to develop practical skills, such as welding and pipe-fitting, that will help sustain the water system and other improvements. Bosscher said one of the key goals of the EWB program is to develop sustainable projects – ones that the residents of Muramba can sustain on their own after the engineering students have left.

For Parks, the work on the water system project inspired him to go back this coming summer. There's more work to be done, he said—establishing medical clinics, securing the health of children, and building better schools for a citizenry in which formal education beyond the 4th grade is rare.

"Rwanda is both beautiful and terrible," he said. "It has terrible, gripping poverty and a legacy of war and genocide. People survive in terrible conditions."

Yet Banks said he was at times overwhelmed by the welcome reception accorded the EWB students from the Muramban residents. They embraced the work of the students, dedicated themselves to building on the group's projects, and urged them to come back.

Banks said he can't wait. "In my opinion, the most important thing we did was build a relationship with this community," he said. "We built a foundation."
Professor Kenneth Potter was honored this past spring at the college’s faculty and staff recognition ceremony for his work on behalf of public environmental projects.

Potter’s dedication to the environment extends well beyond his lab and classrooms walls. Potter has maintained an active commitment in environmental issues for a number of years.

His work has won him national recognition, including his appointment as the vice chairman of the Consortium of Universities for the Advancement of Hydrologic Sciences. The consortium, which includes more than 80 universities and is funded by the National Science Foundation, was founded in 2001 to foster study and research on hydrologic sciences. Potter served as the initial chairman of the consortium’s board of directors. He also serves as a member of the advisory council to the Greater Everglades Restoration, one of the nation’s largest wetlands and conversation restoration efforts.

But Potter is perhaps best known for his work on behalf of the environment in Wisconsin and Dane County. He is a member of the Yahara Lakes Advisory Group, established to help county officials and the State Department of Natural Resources to improve the quality of the Madison area’s signature lakes. The Yahara Lakes Association recognized Potter for his work on behalf of the lakes in 2002 by naming him its “Citizen of the Year.”

He has also worked on behalf of the North Fork Pheasant Branch Task Force, which has worked to maintain one of Dane County’s crucial watershed areas, the Middleton Conservancy Lands Commission, and the Middleton Water Resources Commission. His work with the water commission had helped the City of Middleton adopt some of the most progressive storm water management policies in the state.

Potter has also worked on environmental issues for the Wisconsin Wetlands Association, the UW-Madison Arboretum, the university’s Facilities Planning and Management Office, the state DNR, the U.S. Geological Survey, the Dane County Public Works Department, and villages and cities throughout Wisconsin.

He also served on the steering committee for the Wisconsin Academy of Sciences, Arts and Letters on its “Waters of Wisconsin” program, a two-day conference held in 2002 that featured more than 700 scientists, water resource managers, policy makers, environmental advocates and business representatives discussing ways to preserve the state’s water resources and aquatic ecosystems. The conference led to the official designation in 2003 by the state of Wisconsin as the “Year of Water.”
Professor Larry Bank (pictured) and former CEE graduate student Eric Fink received an award for Best Pultrusion Technical Paper at the COMPOSITES 2004 Convention and Trade Show of the American Composites Manufacturers Association. The paper was titled, “Pultruded Glass Fiber Reinforced Plastic and Paperboard Composite Tubes.” It was the result of research supported by the UW-Madison Industrial and Economic Development Grant Program, with industry partners Sonoco Products Co., Hartsville, S.C., and Teel Plastics of Baraboo. Fink currently works for STS Consultants in Green Bay.

Professor Peter Bosscher has been appointed to the Board of Directors of Engineers Without Borders-USA (EWB-USA). He also serves as the faculty advisor to the UW-Madison EWB student group. The mission of EWB-USA is to help disadvantaged communities improve their quality of life through implementation of environmentally and economically sustainable engineering projects, while developing internationally responsible engineering students. EWB-USA’s outward vision is of a world where all people have access to adequate sanitation, safe drinking water, and the resources to meet their other self-identified engineering and economic development needs. Bosscher will again travel to Rwanda this coming January, the third time in less than 12 months, to further this mission. For more information on EWB, see www.engineerswithoutborders.org/about.html.

Associate Professor Dan Noguera (pictured), along with former student S.K. Chaparro, have been named recipients of the Harrison Prescott Eddy Medal from the Water Environment Federation (WEF). Noguera and Chaparro were selected for their paper, “Controlling Biosolids Phosphorus Content in Enhanced Biological Phosphorus Removal Reactors.”

The paper was originally published in the May/June 2003 issue of “Water Environment Research.” The paper highlights new methods and conditions for reducing the phosphorus content of biosolids from enhanced biological phosphorus reactors, a key consideration in the use of land-applied biosolids.

The Eddy medal recognizes research that makes a vital contribution to the existing knowledge of wastewater treatment principles or processes. Noguera and Chaparro received the medal at the WEF’s annual technical conference in New Orleans in October.

Several civil and environmental department faculty members met in October to hear a presentation on ways in which department graduates can improve skills needed in the civil engineering workplace. Stanford University Professor Renate Fruchter, director of the Center for Integrated Facilities Engineering, led a discussion on her research that suggests civil engineering departments need to do a better job of integrating their classroom teaching and lab research with the skills demanded by contractors, engineering firms, and governments working in civil engineering. In addition, Fruchter’s research suggests departments can do a better job integrating skills learned by students in different civil engineering disciplines, so that students don’t focus too narrowly on a particular set of skills.

Among those participating in the workshop were CEE department Chair Jeff Russell, Professor Larry Bank, Professor Teresa Adams (pictured top), Professor Awad Hanna (pictured middle), Associate Professor Mike Oliva (pictured bottom), and Associate Professor Hussain Bahia.

Timothy Lee, a graduate student in civil and environmental engineering, is one of two College of Engineering graduate students selected to participate in the National Science Foundation 2004 East Asia and Pacific Summer Institutes Program (EAPSI). About 150 U.S. graduate students spend eight weeks in a laboratory where they learn about science, as well as the culture and language of the host country. Lee is studying at Kyoto University in Japan. Working with a professor who is a former UW-Madison postdoctoral fellow, Lee is studying photocatalysis, a process used to clean water and air. Lee, who performs research on this process at UW-Madison, says the international experience will establish new collaborative projects that can be maintained once he returns to the United States.

Associate Professor Greg Harrington was quoted in the August 26 edition of the Milwaukee Journal-Sentinel on efforts in Whitfish Bay, a suburb of Milwaukee, to use an ultraviolet treatment process to remove cryptosporidium and other potential disease-carrying pathogens. Harrington is director of the Wisconsin Consortium for Applied Water Quality Research. Several northern Milwaukee suburbs served by the North Shore Water Department will take part in the treatment process, and have worked with Harrington on how to prevent a potential outbreak of Cryptosporidium like the kind that killed 100 people in Milwaukee in 1993.

Professor John Hoopes was quoted in the July 3 edition of the Milwaukee-Journal Sentinel regarding dumping of sewage into Lake Michigan by the Milwaukee Metropolitan Sewerage District.
Growing up in South Korea, Arthur Hawnn studied English with the hope one day of traveling to the United States. During the Korean War, he put his studies to good use, serving as an interpreter on the front lines of the conflict for the U.S. Marine Corps. Hawnn caught the attention of Capt. Arthur Peterson, a Marine company commander who was also UW-Eau Claire professor as well as a state lawmaker. Peterson encouraged Hawnn to travel to the United States to study, and sponsored a legislative scholarship that paid for Hawnn’s tuition.

Hawnn enrolled at UW-Madison in 1955, and took an interest in civil engineering. He worked his way through college, sometimes holding as many as four jobs at one time to help defray his expenses. Among his jobs: spending fall afternoons scraping off the opaque coating that plant pathologists at the university painted on greenhouses to shade plants from the summer sun.

Hawnn graduated from UW-Madison with a BS in civil engineering in 1959, and went on to earn his MS (1960) and PhD (1962) from the university in civil engineering.

In 1962, Hawnn founded his own company—Arthur F. Hawnn International—in Springfield, Virginia. The company provides consulting work in areas such as transportation, urban development, and water resources management.

Since 1974, Hawnn has worked for the U.S. Department of Defense, where he has worked on transportation projects, design and construction of facilities, and systems development. He currently serves as a senior civil engineer and project manager for the Department of Defense. He has won nine awards from the Department of the Army for his outstanding performance on projects, and is a member of Defense.

Hawnn’s work in transportation field and encouraged other alumni to remember their obligations to the university.

For John Osteraas, more than two decades of engineering expertise came to the fore in the wake of the national tragedy of Sept. 11, 2001. Osteraas, a principal engineer with Exponent Failure Analysis Associates of Menlo Park, California, was deployed to Ground Zero as a lead structures specialist with FEMA’s Urban Search and Rescue program and subsequently led an investigation into the collapse of the World Trade Center towers. Osteraas is one of the world’s leading experts on the performance of structures under extreme loading or stress, and his work with Exponent Failure Analysis Associates played a crucial role in understanding the causes of the collapse and the extent of the damage.

Osteraas and Exponent Failure Analysis also played significant roles in assessing the damage and structural failures resulting from the bombing of the Murrah Federal Building in Oklahoma City, earthquakes in Mexico and California, and the construction collapse of the L’Ambiance Plaza lift-slab building in Bridgeport, Connecticut. He currently manages a project for the Consortium of Universities for Research in Earthquake Engineering aimed at developing engineering guidelines for the assessment and repair of earthquake damage in wood frame construction.

Osteraas enrolled at UW-Madison in 1971, egged on by a bet from his mother following what he described as a boring junior year in high school. He had an interest in art and anthropology, and soon discovered he had little talent for either subject. He dropped out of college and worked in construction, a field he enjoyed.

Family friend Frank Worzala, a professor in the college’s Department of Mining and Materials Engineering, encouraged Osteraas to consider engineering. He re-enrolled at the university, with Professor Worzala’s help landed a part-time job at the Forest Products Laboratory, and quickly fell under the tutelage of noted Civil Engineering Professor Chuck Salmon.

He received his BS in civil engineering from UW-Madison in 1976. Osteraas moved on to Stanford University, where he received both his MS (1977) and his PhD (1990) in civil engineering.

The department held its 8th annual golf outing at Lake Wisconsin Golf Club in Prairie du Sac Sept. 13 raised $15,000 for student scholarships.

Golfers—including department alumni, faculty and staff, and students—were greeted by a late Indian Summer day, with temperatures sneaking into the 70s. Student organizations brought out the national championship concrete canoe, dubbed “Rock Solid,” as well as the steel bridge (shown below) for alumni to view. Everyone enjoyed grilled hamburgers and brats prior to teeing off.

The foursome of Bill Gruetzmacher, Ji Choe, Steve Huberty and Sean DeBeis won the golf outing event with a best-ball scramble score of 54.

Other flag-event winners included:
- Long putt: Scott Easton (Hole No. 2)
- Closest to the pin in one shot: Jacob Sauer (Hole No. 5)
- Closest to the pin in two shots: Sean DeBelts
- Long drive in the fairway (women): Ruth Knight
- Closest to the road on tee shot without going over: Matt Anderson
- Closest to the pin in one shot: Brad Tennie (Hole No. 12)
- Long Drive in the fairway (men): Pete Dering
- Closest to the flag in one shot: Jeff Knudson (Hole No. 15)
- Long putt: Kory Krieser (Hole No. 18)

Mark your calendar for our next event:
Monday, Sept. 12, 2005
at the Bridges Golf Course
Department students organized a food drive during the Halloween season to benefit the Second Harvest Food Bank in Madison. Two students—Jennifer Beahm and Ginny Wendt—organized more than 100 other students to help out with the collection effort, with a third coming from the department. The students collected more than four tons of food, and used the loading docks at Engineering Hall (at left) to organize the food collection. Second Harvest provided a truck to haul the food away.