

Safe Travel

Research at Illinois Center for Transportation contributes to better pavements and safer work zones.

by Leslie Sweet Myrick
photograph courtesy of ICT | Victor Cervantes



A test pavement section under construction at the Illinois Center for Transportation facility.



Imagine this travel scenario:

You are driving on long-lasting pavements and therefore are unhindered by extensive roadway maintenance. The pavement is smooth and quiet-riding, so you can hear your favorite CD just fine. When you do approach a work zone, its set-up makes for safe and orderly travel through. The next work zone is deserted because it is staffed at night. You share the road with quieter and less-polluting semi-trucks. Later, you pull into a state-maintained rest area and are pleased to see it powered by wind turbines. After you reach your destination safely, you realize you enjoyed your drive and saw firsthand that your tax dollars have been put to good use.

Thanks to a research partnership between the University of Illinois at Urbana-Champaign and the Illinois Department of Transportation (IDOT), this scenario is becoming less of a driver's dream and more of a transportation reality.

The Illinois Center for Transportation (ICT) is a premier transportation research center in North America. Headquartered within the nation's #1-ranked Department of Civil and Environmental Engineering, the ICT currently manages approximately 100 research projects. Amid infrastructure challenges and limited funds, its research helps address the urgent and evolving transportation needs of the state of Illinois and the country. The ICT provides national and international leadership on a variety of transportation topics, including pavement design, work zone set-up, driver behavior, assessing infrastructure, and bridge safety, with an increasing emphasis on using technologies that conserve resources.

"In this era of budget cuts and environmental concern, it is more important than ever to optimize our resources and use them efficiently. ICT strives to discover, develop, and implement innovative solutions that keep our transportation network safe, durable, and sustainable," said ICT Director Imad Al-Qadi.

Better Pavements Make for Better Travel

The average traveler is unlikely to contemplate the intricacies of pavement design. However, this same traveler does expect to arrive at his or her destination safely and efficiently without having to stop repeatedly for construction, as well as to be able to carry on a conversation or listen to music over the sound of the car's tires on the pavement.

Such quality pavements that are safe and smooth-riding are the result of optimal design and rehabilitation strategies that have been years in the making. ICT investigators research these strategies, investigate the causes of pavement deterioration, and devise ways to improve pavement design, performance, and rehabilitation methods.

Housed on 47 acres of the former Chanute Air Force base in Rantoul, 15 miles north of the University of Illinois campus, the ICT uses its generous amount of land area for large-scale pavement testing and experiments. For ex-

ample, this facility houses an outdoor, full-scale pavement testing machine—the largest in the country—that is capable of evaluating pavements under real-life vehicular and environmental loading conditions. The machine known as ATLAS (Accelerated Transportation Loading ASembly) simulates years of pavement wear and tear and environmental factors on sections of test pavements. The ATLAS is capable of simulating aircraft, truck, or rail traffic distributions, testing all types of pavement systems, and applying load levels exceeding that of highway and airfield limits. ATLAS is housed in a moveable structure that also controls the effects of daily temperature and moisture changes on the pavement section being studied.

Using ATLAS and numerous other testing methods, both indoor and outdoor, ICT researchers use the information gathered from these experiments to improve pavement design, evaluation, performance, and rehabilitation methods. Longer-lasting pavements that need less maintenance reduce travelers' delays and allow for safer and more enjoyable road trips.

Safer Work Zones for Everyone

Stopping or slowing for road construction is an inconvenience, but that is, unfortunately, not the worst possible problem of road construction. In Illinois alone, work zone accidents result in an average of 2,600 injuries and 33 fatalities per year. And contrary to popular belief, motorists are more likely to get hurt in work zones than workers; motorists account for more than approximately 85 percent of the total injuries. With the end goal of safer work zones for everyone, ICT supports research to study driver behavior and improve the set-up of work zones. Recent ICT studies have investigated the effects of automated speed-radar photo enforcement on traffic flow characteristics and safety in interstate work zones, as well as the factors that affect driver behavior around moving work zones.

If you are lucky enough to zip through a deserted construction zone during your road trip, it may be because that particular project is scheduled for nighttime construction.

Nighttime construction is often advocated to minimize the public's inconvenience and to reduce the potential for work zone accidents. However, poor utilization and placement of the lighting equipment to illuminate the work zone can cause glare that is dangerous to drivers' and workers. Recent ICT research provided recommendations for lighting arrangements to reduce and control lighting glare at nighttime work zones. Thanks to ICT researchers, drivers and workers alike can look forward to all the benefits of nighttime construction and safer work zones for everyone.

Going Green

A recent focus of ICT research has been to develop technologies that conserve resources. Tires and even rest areas contain opportunities for environmentally friendly practices. For example, ICT has taken the lead on U.S. and international

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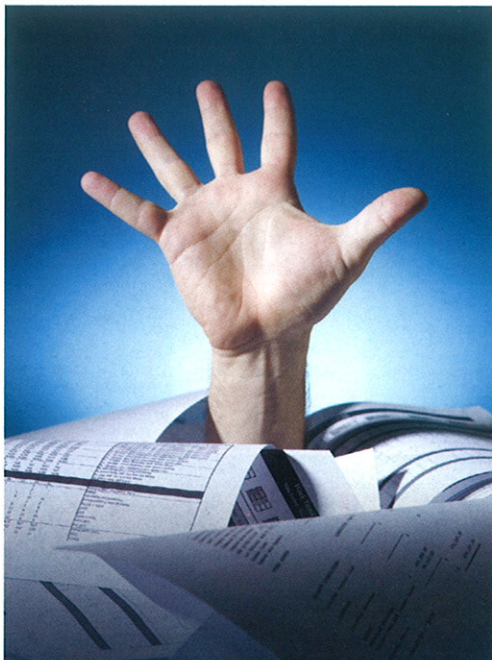
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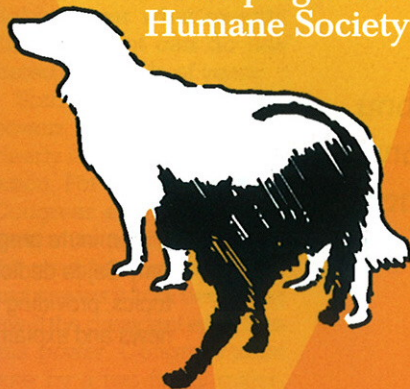
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if all shoes were individually tailored, no one cobbler would have the power to charge monopolistic prices but no cobblers would have enough resources to make specialty shoes, such as running shoes.

With the new administration, however, Stancil believes that there is "no question" that President Obama's appointments will "radically" change enforcement of the antitrust laws. Stancil expects the incoming head of the Federal Trade Commission, Jon Leibovitz, to focus more on immediate harms to consumers: even if a large shoe company can produce specialty running shoes in the future, are they charging consumers too high a price now?

This type of enforcement change highlights the power of the president. With a new administration, the law on the books remains the same, but the portions of the law that the government chooses to enforce can change quite dramatically. This shift in enforcement priorities often angers the opposition party. During the Bush Administration, many Democrats complained that President Bush was failing to enforce the laws and abusing his power, and many Republicans have already expressed fear that President Obama will overstep his powers. Stancil noted that these debates over executive power trace all the way back to the founding of the country.

"In terms of understanding the dynamics of human nature and power, the founders were very wise," Stancil said. The Constitution purposefully pits the president's ambition against that of others. From vetoes and their overrides to arguments over enforcement, the president's powers tell a story of the president's struggle against the Congress and the Supreme Court. Instead of being a mistake, the framers of the Constitution actually intended this struggle because they believed that such a struggle would provide checks against the taking of individuals' liberties. According to Professor Stancil, our Constitution's design has led to conflicts over executive power "from the very beginning, and we will have (these conflicts) forever." ■

Neil Manzullo is an articles editor for the University of Illinois Law Review.

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research related to the wide-base tire, a wider tire that replaces the dual tire system currently on most commercial trucks. The wide-base tire has the potential to provide numerous benefits to the environment, including improved fuel efficiency and lessened gas emissions and noise. However, one source of concern about wide-base tires has been that they may cause increased damage to highway pavements. ICT's research has discounted previously held beliefs about the damage these tires cause and has further demonstrated that wide-base tires will benefit the trucking industry and the environment.

Rest areas also offer an opportunity for environmentally friendly practices. A recent ICT project investigated the viability of using wind power to provide electricity for highway rest ar-

eas and weigh stations. The final report included site-by-site recommendations along with an economic analysis for using wind turbines. The implementation of this project's recommendations could reduce IDOT's energy costs while protecting the environment. IDOT is planning a pilot project later this year to test the use of wind turbines at four locations.

ICT Looks Toward the Future

Since its inception in 2005, the ICT has continued to grow, diversify, and promote its research. Last summer, IDOT renewed its commitment to ICT by agreeing to invest more than \$15 million dollars over the next three years (July 2008 – July 2011). The center has already supported more than 55 young, talented graduate students who will be future leaders in the transportation industry.

At its inception, the center consisted of primarily pavement research by University of Illinois researchers. Now, it sponsors more than 40 researchers from several other universities in addition to the three U of I campuses, private consulting firms, and other governmental agencies. Working together with IDOT, the researchers at ICT are bringing some of the traveling public's dreams, as described in the scenario above, closer to a reality.

For more information about the ICT and its research, visit www.ict.uiuc.edu.

Leslie Sweet Myrick is an editor at the Illinois Center for Transportation.

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ball handling skills. He also plans to serve as a counselor at the LeBron James Skills Academy, scheduled for July 5-9 in Akron, Ohio. The highlight of working that camp will be competing in the counselors' daily pick-up games, which feature some of the top collegiate players from across the country.

Men's Tennis Team The Illinois men's tennis team does not have a break in action during the hot Illinois summers; instead, they split off, with individuals traveling across the country to participate in tournaments. Some of the "Futures", as they are referred to, take place locally, while others are scattered around the nation. The summer tournaments allow current Illini to reunite with Illinois alums on the Futures circuit, as their paths often cross at various events. During the summer, the Illini also get the chance to watch several former Illinois stars on the professional tour. Two Grand Slam competitions, Wimbledon and the U.S. Open, are held each year in the summer, giving fans across the world the opportunity to experience the talented tradition of Illinois tennis.

Luke Guthrie, Men's Golf Freshman Luke Guthrie will join many of his teammates in playing several big-time tournaments. Last year Guthrie reached as high as seventh in the Polo American Junior Golf Association (AJGA) rankings. He will try to become the second downstate player to win the Illinois State Amateur on August

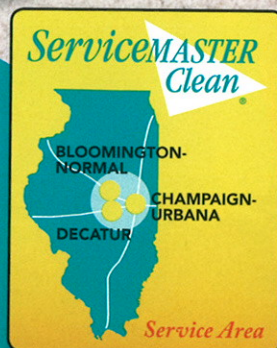
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