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# Are We There Yet?

South Carolina Transportation Technology Transfer Service

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## The Great Escape: How Retirement, Recruitment, and Retention are Impacting the Field of Public Works

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While recently attending a retirement party for a 38-year career public works employee, I was shocked by the number of his fellow employees who were planning for retirement within five years. In that particular division, over 40 percent of the employees (25 out of 60) were eligible for full retirement by 2009—virtually all of them serving in key technical, planning, or administrative positions. Our surveys indicate that many public works organizations will face similar retirement numbers beginning in 2005 and escalating rapidly for the next twenty years. In one department I recently visited, fully 80 percent of an entire division will be eligible for retirement before 2010!

This phenomenon is certainly not new. According to the Bureau of Labor Statistics, between 2002 and 2012 the number of people in the labor force ages 55 and older will increase by 51 percent and those ages 65 and older by 43 percent. Obviously, this means that large numbers of older employees will reach retirement age at approximately the same time. For those working in “Rule of 85” or “Rule of 90” programs, many are eligible for retirement beginning at age 55 or even younger. No matter how the numbers are calculated, the message is irrefutable—large numbers of public works employees, many with great technical expertise, will begin retiring within five years. The

challenge of replacing talented employees has become a major national crisis that must be addressed by not only the public works profession but also by elected officials and public managers in every state, city and county in America.

### The growing dilemma

There is an element of “predictable surprise” in this dilemma. A simple review of age and tenure can help predict potential retirement schedules and estimated numbers. More departments are becoming aware of the situation and are able to predict the talent loss. But awareness often compounds the true challenge—replacing seasoned professionals who have gained the bulk of their institutional memory through many years on the job with continuous training during years of extraordinary technical innovation. Simply placing ads to replace retiring talent does not address issues of lost institutional knowledge, acquired skills, and community-wide collaborative relationships.

It is clear that the number of seasoned, talented public works professionals approaching retirement far outpaces the number of young or mid-career employees entering the profession. Yet recruitment is becoming more difficult, turnover is higher than ever, and options for training and career development are being hampered by misguided budgetary decisions. At a time when the public works profession is being decimated with retirements there are converging variables that portend a grim future. How public

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works, transportation and utility organizations deal with this growing dilemma will have a huge impact on every community's ability to sustain basic infrastructure that supports a level of comprehensive community development that is essential for economic vitality.

## A tough sell

Conversations with senior managers across the U.S. have underscored the difficulty with recruitment. With some positions open for six to eighteen months, many departments still cannot attract the expertise required to replace seasoned veterans. Surveys conducted during broad-based strategic planning reveal that the current public environment has created a negative atmosphere in which to recruit and that retention is growing increasingly difficult.

Clearly, many public works organizations have not gained a significant level of respect, stature and support in their communities. In many ways, they continue to remain transparent to the general public. This is partially due to the tendency of technical professionals to focus on critical projects while spending little time on public relations or political coalition building. There is little time for image building when waste treatment, road resurfacing, water system capacity, stormwater planning, and reducing traffic congestion remain vital to community development. Unfortunately, the result is that our public works departments are rarely seen as magnets for young career-minded professionals.

The number and complexity of technical projects have also escalated over the past twenty years while public scrutiny and political demand have become almost overwhelming. In our studies, we consistently find that very few public works departments have staffing levels adequate for the growing workload, yet financial support has declined as budgets are stretched by slow economies, conflicting priorities, and continuing security concerns. And, with so many conflicting projects, it has become increasingly difficult to sustain long-term project plans without constant amendment.

Similar to the aging public infrastructure, the facilities and capital equipment of many departments have become outdated and insufficient to meet evolving program needs. Luring new talent to a department through the promise of great facilities, the latest technology, and modern equipment is not an option for many managers. Yet, among high school and college graduates, these ingredients are among those most often noted when describing an ideal work environment.

Perhaps the two most significant issues for potential recruits are salary and career opportunities. Frankly, salaries have not kept pace with private industry and are in many places 25% to 40% below similar positions in industry. To exacerbate this, many recruits seem interested if there is a

clear career path and the promise of job growth, but decline when learning that training and professional development budgets have been all but eliminated. A pretty bleak picture for mid-career recruits or bright young people who are seeking a promising career!

In this environment, why would anyone want to join or remain with a public works organization? What might motivate talented people to join the public works team, build a career, and do great work?

## The "Catch-22"

Taken alone, the growing number of retirements would seem to be a straightforward problem. But when combined with the increasing number of employees leaving public works after staying from three to ten years and the lack of recruitment success, the challenges stated here have no simple remedy. While business journals such as Forbes, Fortune, and INC. magazine also address the pending number of Baby Boomer retirements, various authors suggest sensible remedies related to salary adjustments, accelerated career paths, more elaborate professional development options, and ingenious recruiting strategies. This might work fine for private industry, but are those same options available to government? Essentially, the answer is "No."

Cumbersome personnel and human resource policies hamper recruitment at a time when process innovation and evolution have become vital. When compared to private business, public agencies are far too constricted and confined when competing for talent, especially in highly technical fields. Similarly, salary surveys consistently indicate that private industry is far ahead of government when establishing equitable salary structures, something sorely needed for almost every professional or technical position in public works. When adjustments are required to attract talent, business can make them virtually overnight—something that is generally impossible in overly bureaucratic and ponderous public personnel systems. (This is often not due to lack of expertise among HR and personnel staff, but to archaic public policy and/or lack of awareness and support among elected officials.)

As noted earlier, when promising applicants are inclined to accept a position for less money they often lose interest due to poorly defined career paths and the absence of formal professional development programs. Even the prospect of working on challenging public projects cannot overcome a marginal salary, long hours, constant public/political scrutiny, unclear career opportunities, and lack of continuing professional training. So, at a time when we are losing many of our most respected senior employees, technical complexity and project workload are increasing, and retention is becoming more difficult, public works

leaders are finding even fewer options for sustaining or building a workforce to meet predicted demand.

## Five recommendations

There are five critical areas where progress is needed. Each requires collaboration with and support from elected officials, personnel managers, and human resource departments, but all offer the means to break the cycle that will otherwise continue to plague the public works profession.

*Provide a “clinical” assessment of employee retirement, turnover and retention issues.* Prepare a very clear, concise and “clinical” assessment of employee retirement with schedules showing loss of institutional memory as well as essential technical knowledge and skills. Consider this a discussion paper that outlines the situation pertaining to talent loss, rate of turnover, declining tenure, and recruitment difficulties. Review the status of professional development and training programs, indicating their value and your department’s current level of formal employee development. Discuss salary surveys, with supportable data related to comparable salaries in similar industries and government agencies. Inform decision makers of the issues with documented impact on program and project delivery, service quality, and cost to the community.

*Focus on employee training and development.* For many technical disciplines, half of what is learned in college or in specialized training is obsolete within five to eight years. State and local government has been extraordinarily myopic about continuing professional development, often cutting the very training and development programs that would otherwise help sustain desired quality and service levels. Public works leaders must address this through honest discussions with elected leaders and policy makers. Establish mentoring programs, develop internal orientation and training programs for core competencies and specialized skills, and create your own development systems. The International City/County Management Association (ICMA) has published and currently distributes this author’s guide detailing how to evolve from performance review systems to employee development systems that promote performance while creating clear career paths for all employees. Research tells us that new recruits and established employees will increasingly demand career and professional development. To successfully retain employees and recruit new talent, it is essential.

Remember, the only thing worse than training people and having them leave is not training them and having them stay.

*Use retired technical talent.* Recent AARP surveys report that fully 80% of retiring Baby Boomers plan to work in retirement. This will provide and is already providing a huge

talent repository replete with every technical specialty and type of experience needed in most departments. The only barriers involve existing policies that might not accommodate individuals who want to work part time or have very flexible hours. Forward-thinking leaders will recognize this cadre of talented professionals and immediately begin to develop personnel policies that allow flexible contracts. Based on survey information, retirees in this growing talent pool are already well trained, are inured to difficult project demands, like to work, and are very experienced. Combined with sensible recruitment and succession planning, using capable retirees will ensure adequate staffing for scheduled projects, provide more senior talent to use as mentors, and will moderate staff costs.

*Conduct succession planning.* Similar to private industry, it is essential that every public works department have a clear management development and succession plan. Take time to analyze the management structure and determine how retirement or resignations might impact service delivery, institutional memory, and operating effectiveness. Develop If-Then scenarios for several potential situations involving loss of personnel and pose remedies designed to maintain the highest quality work output and project delivery. For those considered top leadership candidates, provide a formal development program that will allow them to grow professionally while preparing for potential management openings. Invite broad participation—every learning opportunity pays dividends for both the community and your department.

*Accelerate recruiting.* Public works must establish itself as a wise professional career choice. This cannot be done without a totally revamped recruiting system that actively seeks new talent, both early and mid-career. Learn to showcase your department and what it means to the community. Establish a team of employees that visit local high schools, junior colleges and universities during career fairs, explaining to prospective candidates the exciting challenges associated with public works. Talk about your history, contributions, projects, career opportunities, job variety, and other aspects of public service. This must be done as a formal, planned and continuous process that may require support from elected officials. They must understand that it takes time and resources but will pay dividends to the community while ultimately saving money.

## Meeting the challenge

For leaders of technical organizations, sustaining a strong employee base is similar to football coaches who have to constantly recruit new talent to take the place of graduating or lost players. It takes a concentrated effort and often requires new processes, structures, and support systems.

(cont. on page 5)



# What Corporate America Cannot Build: A Sentence

By Sam Dillon

BLOOMINGTON, Ill. — R. Craig Hogan, a former university professor who heads an online school for business writing here, received an anguished e-mail message recently from a prospective student.

“i need help,” said the message, which was devoid of punctuation. “i am writing a essay on writing i work for this company and my boss want me to help improve the workers writing skills can yall help me with some information thank you”.

Hundreds of inquiries from managers and executives seeking to improve their own or their workers’ writing pop into Dr. Hogan’s computer in-basket each month, he says, describing a number that has surged as e-mail has replaced the phone for much workplace communication. Millions of employees must write more frequently on the job than previously. And many are making a hash of it.

“E-mail is a party to which English teachers have not been invited,” Dr. Hogan said. “It has companies tearing their hair out.”

A recent survey of 120 American corporations reached a similar conclusion. The study, by the National Commission on Writing, a panel established by the College Board, concluded that a third of employees in the nation’s blue-chip companies wrote poorly and that businesses were spending as much as \$3.1 billion annually on remedial training.

The problem shows up not only in e-mail but also in reports and other texts, the commission said.

“It’s not that companies want to hire Tolstoy,” said Susan Traiman, a director at the Business Roundtable, an association of leading chief executives whose corporations were surveyed in the study. “But they need people who can write clearly, and many employees and applicants fall short of that standard.”

Millions of inscrutable e-mail messages are clogging corporate computers by setting off requests for clarification, and many of the requests, in turn, are also chaotically written, resulting in whole cycles of confusion.

Here is one from a systems analyst to her supervisor at a high-tech corporation based in Palo Alto, Calif.: “I updated the Status report for the four discrepancies Lennie forward us via e-mail (they in Barry file).. to make sure my logic was correct It seems we provide Murray with incorrect information ... However after verifying controls on JBL - JBL has the indicator as B ??? - I wanted to make sure with the

recent changes -- I processed today -- before Murray make the changes again on the mainframe to ‘C’.”

The incoherence of that message persuaded the analyst’s employers that she needed remedial training.

“The more electronic and global we get, the less important the spoken word has become, and in e-mail clarity is critical,” said Sean Phillips, recruitment director at another Silicon Valley corporation, Applera, a supplier of equipment for life science research, where most employees have advanced degrees. “Considering how highly educated our people are, many can’t write clearly in their day-to-day work.”

Some \$2.9 billion of the \$3.1 billion the National Commission on Writing estimates that corporations spend each year on remedial training goes to help current employees, with the rest spent on new hires. The corporations surveyed were in the mining, construction, manufacturing, transportation, finance, insurance, real estate and service industries, but not in wholesale, retail, agriculture, forestry or fishing, the commission said. Nor did the estimate include spending by government agencies to improve the writing of public servants.

An entire educational industry has developed to offer remedial writing instruction to adults, with hundreds of public and private universities, for-profit schools and freelance teachers offering evening classes as well as workshops, video and online courses in business and technical writing.

Kathy Keenan, a onetime legal proofreader who teaches business writing at the University of California Extension, Santa Cruz, said she sought to dissuade students from sending business messages in the crude shorthand they learned to tap out on their pagers as teenagers.

“hl KATHY i am sending u the assignmnet again,” one student wrote to her recently. “i had sent you the assignment earlier but i didnt get a respond. If u get this assgnment could u please respond . thanking u for ur cooperation.”

Most of her students are midcareer professionals in high-tech industries, Ms. Keenan said.

The Sharonview Federal Credit Union in Charlotte, N.C., asked about 15 employees to take a remedial writing course. Angela Tate, a mortgage processor, said the course eventually bolstered her confidence in composing e-mail, which has replaced much work she previously did by phone, but it was a daunting experience, since she had been out of school for years. “It was a challenge all the way through,” Ms. Tate said.

Even C.E.O.'s need writing help, said Roger S. Peterson, a freelance writer in Rocklin, Calif., who frequently coaches executives. "Many of these guys write in inflated language that desperately needs a laxative," Mr. Peterson said, and not a few are defensive. "They're in denial, and who's going to argue with the boss?"

But some realize their shortcomings and pay Mr. Peterson to help them improve. Don Morrison, a onetime auditor at Deloitte & Touche who has built a successful consulting business, is among them.

"I was too wordy," Mr. Morrison said. "I liked long, convoluted passages rather than simple four-word sentences. And I had a predilection for underlining words and throwing in multiple exclamation points. Finally Roger threatened to rip the exclamation key off my keyboard."

Exclamation points were an issue when Linda Landis Andrews, who teaches at the University of Illinois at Chicago, led a workshop in May for midcareer executives at an automotive corporation based in the Midwest. Their exasperated supervisor had insisted that the men improve their writing.

"I get a memo from them and cannot figure out what they're trying to say," the supervisor wrote Ms. Andrews.

When at her request the executives produced letters they had written to a supplier who had failed to deliver parts on time, she was horrified to see that tone-deaf writing had turned a minor business snarl into a corporate confrontation moving toward litigation.

"They had allowed a hostile tone to creep into the letters," she said. "They didn't seem to understand that those letters were just toxic."

"People think that throwing multiple exclamation points into a business letter will make their point forcefully," Ms. Andrews said. "I tell them they're allowed two exclamation points in their whole life."

Not everyone agrees. Kaitlin Duck Sherwood of San Francisco, author of a popular how-to manual on effective e-mail, argued in an interview that exclamation points could help convey intonation, thereby avoiding confusion in some e-mail.

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*(cont. from page 3)*

For public works, this major leadership challenge must be shared with elected policy makers as well as public managers at all levels. The changes needed to address growing problems are not small, but not meeting challenges associated with retirements, recruitment and retention will have potentially disastrous long-term consequences.

Of all the work required of public works leaders, developing and sustaining a competent, vibrant, and renewable workforce is the most essential. Don't ever forget that employees are your greatest single asset, with the power to energize or debilitate, create or destroy, innovate or stagnate, motivate or contaminate a section, bureau, division, or entire department. The challenge is defined...the choices are clear. ♡

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"If you want to indicate stronger emphasis, use all capital letters and toss in some extra exclamation points," Ms. Sherwood advises in her guide, available at [www.webfoot.com](http://www.webfoot.com), where she offers a vivid example:

">Should I boost the power on the thrombo?

"NO!!!! If you turn it up to eleven, you'll overheat the motors, and IT MIGHT EXPLODE!!"

Dr. Hogan, who founded his online Business Writing Center a decade ago after years of teaching composition at Illinois State University here, says that the use of multiple exclamation points and other nonstandard punctuation like the :- ) symbol, are fine for personal e-mail but that companies have erred by allowing experimental writing devices to flood into business writing.

He scrolled through his computer, calling up examples of incoherent correspondence sent to him by prospective students.

"E-mails - that are received from Jim and I are not either getting open or not being responded to," the purchasing manager at a construction company in Virginia wrote in one memorandum that Dr. Hogan called to his screen. "I wanted to let everyone know that when Jim and I are sending out e-mails (example- who is to be picking up parcels) I am wanting for who ever the e-mail goes to to respond back to the e-mail. Its important that Jim and I knows that the person, intended, had read the e-mail. This gives an acknowledgment that the task is being completed. I am asking for a simple little 2 sec. Note that says "ok," "I got it," or "Alright."

The construction company's human resources director forwarded the memorandum to Dr. Hogan while enrolling the purchasing manager in a writing course.

"E-mail has just erupted like a weed, and instead of considering what to say when they write, people now just let thoughts drool out onto the screen," Dr. Hogan said. "It has companies at their wits' end."

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# Leaders in Safety

*adapted from "The Many Faces of Safety" by John Baxter, Director of FHWA's Office of Safety Design in Washington DC., Public Roads Magazine, Mar/April 2005*

More than 42,000 fatalities occur on American highways every year. Those deaths are not just numbers or statistics.

"Every highway fatality is someone's daughter, son, friend, or coworker. These are real people and someone's loved ones," says Commissioner John F. "Jack" Lettiere of the New Jersey Department of Transportation (NJDOT).

There are many faces in the safety equation: the victims, the survivors...and the leaders who will step up to champion safety. If the United States is to meet the national safety goal of reducing the fatality rate to 1.0 per 100 million vehicle miles traveled by 2008, Lettiere says, "You've got to take it personally when someone dies on our highways."

To be effective in achieving any safety goal, leadership in the State departments of transportation (DOTs) and the State division offices of the Federal Highway Administration (FHWA), along with other agencies at the Federal, State, and local levels, must take personal ownership and responsibility for safety improvements.

Leadership is defined in many ways, but at the heart of any definition is the ability of an individual to influence others to take action. At the national level, safety is one of FHWA's top priorities, and safety leadership can play a vital role in making Americans safe on the Nation's highways. Systematic improvements to the road network can, over time, result in thousands of lives saved.

FHWA supports a number of national safety programs, including reducing crashes at intersections, designing roads for safety, stopping red light running, improving safety in work zones, adding rumble strips, improving highway-rail grade crossings, and increasing safety for pedestrians, bicyclists, and older drivers. International safety scan tours sponsored by FHWA and the American Association of State Highway and Transportation Officials (AASHTO) are another major resource for fostering leadership by State and local officials.

## What Makes a Leader?

"A leader is someone who can provide a vision, enthusiasm, and support to get people to accomplish things," says New Jersey Commissioner Lettiere. If current practice is not reducing highway fatalities, then a new vision is needed. Leadership often involves persuading an agency's staff, decision makers, or stakeholders to move in a direction that may be different from where they were going in the past.

Persuading transportation professionals to take a new direction takes courage. "A good leader has to be willing to put herself or himself on the line, take some prudent risks and be willing to challenge current thinking about things," says Lettiere, whose agency has 16,000 employees and a \$3 billion budget. He continues, "In a big bureaucracy, it's easy to become complacent and not be willing to make mistakes. But if you take risks, people will be willing to jump on your bandwagon."

In addition to courage, safety leaders need to be decisive, says South Carolina Department of Transportation (SCDOT) Executive Director Elizabeth S. Mabry. "You should be more cooperative than dictatorial," she says, "but sometimes there comes a point when you have to take the bull by the horns and just make a decision." She adds that safety leaders have to "get out in the field and talk with employees at all levels at all different kinds of jobs. You have to be hands-on and in the trenches, but not in the weeds."

In a leadership training program that Director Mabry started 8 years ago, she looks for candidates who use common sense, are problem solvers, are concerned about others, are team players, and who do not allow internal rules or guidelines to get in the way of doing something good. "Sometimes it's too easy to have a rule book that says when this occurs, you do this or that," she says. "But life is not that simple." She pauses and then adds, "And a broad understanding of all the issues facing SCDOT coupled with a good sense of humor carry people a long way." (see sidebar: Leadership Training in SC, The STTAR Program)

Leadership requires other personal qualities as well. Florida State Safety Engineer Ed Rice lists energy, enthusiasm, "passion without seeming like a zealot since that tends to alienate people," persistence, and "that overworked phrase, 'out-of-the-box' forward thinking." He also believes that no one can "do safety" without being fully committed. "I work hard at it," he says. "I often spend hours looking at the data and trying to figure out what's causing some of our problems. The more information and knowledge of the subject you have, the better you can sell your program."

And, like South Carolina's Mabry, Rice says that a leader has to be visible. "If you're a leader and never show up anywhere, you're essentially an invisible leader, and people may not know your position or commitment to the subject." Instead, he believes in what has been called "management by walking around," or, in the case of promoting safety, management by being visible and by being heard.

Resiliency is another essential, he says. No one should expect everything to go smoothly in any job, but it is

important to avoid becoming discouraged. You have to expect frustration, but he says, “Someone once said that in measuring success it’s not how high you reach, but how often you get back up after being knocked down.”

The U.S. Office of Personnel Management (OPM) calls these personal traits “leadership competencies.” In addition to vision, decisiveness, and resiliency, OPM lists political savvy, creativity and innovation, entrepreneurship, flexibility, and, above all, integrity and honesty.

A strong leader also has technical credibility, according to OPM, and understands the value of providing decisionmakers and stakeholders with accurate data on a project’s disadvantages as well as its advantages.

“Sometimes people downplay the negative aspects,” says Welch, “but your bosses will read that real quickly and won’t have trust in you.”

### Leadership Model

Defining what really constitutes leadership is difficult, but one pair of safety leaders has articulated a leadership “model”—a process for influencing others to take action on highway safety. In South Carolina, the FHWA Division Administrator Bob Lee, cowinner of FHWA’s 2004 safety award, and SCDOT Executive Director Mabry offer a six-step process. At the heart of this influence model is the safety champion—a leader with the desire to see positive change and the vision and daily commitment to see the change through to fruition. The six steps support the real key to success—execution of plans through assertive action by leaders. Some of the six steps are similar to components of the leadership models offered by experts who target the business world or government, such as Robert D. Behn of the John F. Kennedy School of Government at Harvard University in his *Managing for Performance and Results Series*. Another example is Major General Perry M. Smith’s (retired from the U.S. Air Force) article, “Learning to Lead,” published in the *Marine Corps Gazette*. Both offer a set of leadership practices and tips for ratcheting up performance.

Under any model, influence does not happen overnight. Nor is it something that a person can exercise at will. It is not something to be tried once and then abandoned. Instead, it is an ongoing challenge. In addition to all the other personal traits of leaders—enthusiasm, courage, energy, decisiveness, and so on—a strong leader has the ability to establish trust, which is the first stage in South Carolina’s six-step leadership model. ▾

### South Carolina’s Six Steps to Successful Leadership

1. Establish trust.
2. Provide motivation to change the status quo.
3. Develop a plan with partners.
4. Build upon early successes.
5. Expand through innovation.
6. Sustain through accountability.

Execution of a safety program includes not only developing strategic plans and measurable goals, but also monitoring progress, holding individuals responsible for obtaining results, and rewarding real accomplishments. Execution hinges on daily personal involvement by the transportation leadership.

The safety efforts are data driven and results oriented. They are also significant because the partnerships between FHWA and the State DOTs have expanded to include local agencies that own a significant share of the challenge. It is essential that transportation professionals do not lose sight that the transportation community’s most important service to the public is a safe transportation system. ▾

*Editor’s note: This article touches on only a few examples of safety leadership, but there are many more around the country—please visit <http://www.tfhrc.gov/pubrds/05mar/03.htm> to read the entire article.*



# Safety Zone



## Study Seeks Effective Ways to Reduce Road Work Zone Injuries

by Mary Lou Jay

Workplace fatalities have generally declined over the last decade, but worker deaths at road construction sites have remained at the same level (in the low 100s each year) since 1998. During the 1995 to 2002 period, 844 workers were killed while working at a road construction site, according to a recently released report from the Bureau of Labor Statistics (BLS). More than half of these fatalities were caused by a worker being struck by a vehicle or mobile equipment.

Until recently, much of the attention on reducing work zone fatalities focused on the interactions between workers and the traveling public. But the BLS report notes that “workers at a road construction site face a greater likelihood of being struck by a construction vehicle or construction equipment than of being struck by a car.” So the National Institute for Occupational Safety and Health (NIOSH) has started looking at ways to reduce fatalities within the work zone. One of its current research studies is evaluating the effectiveness of two different approaches.

The study, “Evaluating Roadway Construction Work Zone Interventions,” grew out of a NIOSH-sponsored workshop held in 1998. At this meeting, representatives from government, labor, industry, academia, and state departments of transportation brainstormed ways in which everyone involved in the road construction process could reduce the dangers to workers. One recommendation was for research that would determine which approaches actually work.

David Fosbroke, a statistician with NIOSH’s division of Safety Research in Morgantown, W.V., is one of three researchers leading the study. “We are looking at two different approaches—administrative controls, which includes work practices, and engineering controls, which include proximity warning systems,” he said.

### Testing Traffic Plans and Warning Devices

The work practices part of the study focuses on internal traffic control plans (ITCP). “These take all the concepts that contractors should know from traffic control and—rather than applying them to motorists passing the work zone—apply them

*(Cont. on page 9)*

## Health Zone

### Concentrate on Your Core

by the American Institute for Cancer Research

Whenever you walk or run, your core muscles are active, keeping you upright, balancing your body as your weight shifts and absorbing the impact as your feet hit the ground. Your body’s core forms the foundation of all your movement. If your core is weak, you are susceptible to poor posture and injury. Lower back pain is also more likely to occur.

Your core muscles lie deep within your torso and pelvis. They are layered, overlapping and connected to each other.

Unlike weight lifting, a core-strengthening program exercises your whole system at once. You also don’t need any equipment. The strength you use in holding a position – as well as the gravitational pull of your own weight – work out the core muscles. You’ll be surprised at how great an effect a simple routine can have on your daily living activities.

### The Core Benefits

The major core muscle is called the transversus abdominis. It is deep in your abdomen and circles your torso. To feel it contract, pull your belly button toward your spine. Hold the contraction for 10 seconds, then release. Repeat several times. You can do this exercise anytime, anywhere.

Breathing is important while you do core exercises. Practice breathing deeply from your diaphragm before starting core exercises. Sit or stand with your back straight and shoulders relaxed. Exhale through your mouth for 6 seconds, expelling as much air from your lungs as you can. Then inhale for 6 counts, feeling your belly and chest expand as your lungs fill



with air. Repeat 3 times, then breathe at a more normal pace throughout your exercises.

The following core exercises are simple enough to do on your own. To be safe, you should always check with your doctor before trying any new exercises.

**Leg Press.** Lie on the floor with your knees bent and the soles of your feet on the floor. Raise your right leg off the floor with the knee still bent until your leg forms a 90-degree angle. Rest your right hand on the kneecap. Push against your knee with your right hand while pulling your knee toward your hand with your abdominal muscles. Hold for 3-4 deep breaths. Repeat with the left leg and hand.

**Abdominal Crunch.** Lie on your back and place your feet on the wall, so that your knees form a 90-degree angle. Cross your arms on your chest. Keep your gaze fixed forward. Using your abdominal muscles – not your neck – lift your chest as far as you can off the floor, even if it is only an inch or two. Hold for 2-3 seconds if you can, then release. Repeat 8 times. Remember to breathe deeply throughout this exercise.

For more core strengthening exercises and easy to follow pictures, visit [MayoClinic.com](http://MayoClinic.com) and do a search for “core exercises.” To enroll in a course that strengthens core muscles, try Pilates. To find an instructor near you, search the Pilates Method Alliance website at [www.pilatesmethodalliance.org](http://www.pilatesmethodalliance.org).



to workers and equipment moving in the work site. “Our goal in the study is to see if we can organize the flow of work to minimize the time that workers are in danger of being struck on the site,” said Fosbroke. Some contractors and foremen already use such plans on their sites, although they do not call them ITCPs.

For the proximity warning systems, NIOSH will be testing commercially available sonar, radar, and camera systems as well as an electromagnetic system that it has developed. The sonar and radar systems will include two sensors mounted on the back of a dump truck. The sensors can detect anything behind the truck in an 8 to 10-foot range. The drivers in the cab will have both audible alarms and visual indicators if someone (or something) is behind them. The camera system will be mounted on the back of a dump bed with a video monitor in the cab to eliminate the driver’s blind spot.

The electromagnetic system is different because it will warn the workers (rather than the drivers) when they are too close to the truck. The electromagnet mounts on the back of the truck, and the workers wear receivers that sound alarms.

## Data Collection Starts Now

It’s taken four years for NIOSH personnel to set up the research parameters, prepare the equipment, and run preliminary tests. They have worked with organizations such as NAPA, ARTBA, LIUNA, IUOE, and with individual paving contractors to determine the best way to conduct the study to make the data meaningful.

Now they are ready to collect data. During the next two years, the researchers need eight contractors who are willing to take part in the study. Contractors will be asked to allow researchers to make observations at two of their sites. The first site will be used both as a control site and as a test site. “We will collect data there for two weeks, and then go back to the same site and observe what happens with the proximity warning systems for one week,” explains Fosbroke.

At the second site, the study principles will observe what happens when the contractor uses an ITCP plan (they will work with the contractor’s personnel to draw up such plans).

Researchers will track both sites’ activities in three ways. “We’ll have video cameras at multiple angles, all time-synched so that we’ll have four views of the site to determine where someone is at any given time,” says Fosbroke. “It’s the same kind of system that the NFL uses to see whether a receiver has control of the ball and whether he is within bounds.”

GPS equipment will be placed on both workers and equipment to track their movements through the use of satellite technology. Trained observers will also be at the site during the research week to note worker and equipment movement. The multiple methods of observation will serve as a kind of “fail-safe” system, Fosbroke says.

After data collection, researchers will need about a year to analyze what they’ve found before releasing the results of their study.

*(Cont. on page 10)*

# T<sup>3</sup>S Has a New Exhibit



The new exhibit was designed by Brian Verhoeven for T3S in the Spring of 2005. It made its debut at Myrtle Beach during the APWA annual meeting. We look forward to showing it off at future events!

(Cont. From Page 9)

“It’s time the industry had good data on what does and doesn’t work in preventing work zone injuries,” says Fosbroke. “These concepts all seem reasonable on paper, but our goal is to find out if using them actually reduces the amount of time that workers are in hazardous areas around asphalt dump trucks, rollers, and any other pieces of construction equipment.

“No one has ever done this before by actually getting data. We need to go beyond the anecdotal to a controlled experiment. We need to find out if these interventions are something that is worthwhile for contractors to do.”

## Save These Dates!

Please save these dates – May 21-23, 2006! The 10th Southeast Local Roads Conference is coming to Chattanooga, Tennessee. The Tennessee Transportation Assistance Program (TTAP) will be hosting the conference in collaboration of the Federal Highway Administration (FHWA) and the southeastern LTAP Centers, which include Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico and South Carolina.

This local roads conference is targeted for county, city, and public works personnel, contractors, vendors, consultants and all those whose work impacts the movement of persons and goods on local roads. It provides the opportunity to share success stories and innovative advances in transportation planning, traffic safety operations, roadway design, maintenance and construction. The conference combines technical presentations with highway products exhibits to provide a forum for exchange of ideas within the local roads community.

We have reserved the Chattanooga Marriott at the Convention Center as the conference hotel and sleeping rooms are available at a special conference rate of \$79++ (code: utkutkk (single room) and utkutkd (double room)). The conference will be at the Chattanooga Convention Center, which is adjoined to the hotel. More information on the conference will be coming soon.

Mark those dates on your calendar! We will be sending out early registration forms and a preliminary agenda soon. Exhibitor space will be allotted on a first come, first served basis. Vendors who are interested in participating in this conference can contact Jenny Jones at [gohjones@utk.edu](mailto:gohjones@utk.edu) for more information.

# Information Request and Address Change Form

Videos and publications from our library are available on-line at [www.ces.clemson.edu/t3s](http://www.ces.clemson.edu/t3s).

The videos and publications are free to individuals employed by any city, county or state government agency in South Carolina. You can obtain a free single copy of most publications, or borrow a copy of one of our “for loan” publications and videos.

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## Publications

- Signalized Intersections*—FHWA-HRT-04-091 (350 pages)  
Available on-line at [www.tfhrc.gov/safety/pubs/04091/01.htm](http://www.tfhrc.gov/safety/pubs/04091/01.htm)
- Full Road Closure for Work Zone Operations, A Case Study*—FHWA-HOP-05-012  
Available on line at [http://ops.fhwa.dot.gov/wz/docs/Delaware\\_v3/full\\_closure\\_delawar.pdf](http://ops.fhwa.dot.gov/wz/docs/Delaware_v3/full_closure_delawar.pdf)
- Transportation Finance, Meeting the Funding Challenge Today, Shaping Policies for Tomorrow*—TRB ISBN 0-309-09499-2
- NCHRP Report 539, Aggregate Properties and the Performance of Superpave—Designed Hot Mix Asphalt* Available only on line at [http://ops.fhwa.dot.gov/wz/docs/Delaware\\_v3/full\\_closure\\_delawar.pdf](http://ops.fhwa.dot.gov/wz/docs/Delaware_v3/full_closure_delawar.pdf)
- Road Safety Audits, “Saving Lives, Saving Money”*— (Brochure) FHWA, ITE

## CD-ROM

- Introduction of Ground Anchors*, Two interactive cds that provides field inspectors with the background knowledge of construction ground anchors and instructions for inspections of ground anchors during construction.

## DVD

- High Performance Concrete, Structural Designers Guide*— FHWA  
Available on-line <http://knowledge.fhwa.dot.gov/hpc>

## Videos

- People First Management*— LENGTH: 50, SOURCE: Stanford School of Business; The cornerstones of good business: credibility, respect and fairness. How to give your employees a vested interest in your company’s success. The critical need for setting clear expectations, and acting accordingly.
- Extraordinary Results with Ordinary People*— LENGTH: 52, SOURCE: Stanford School of Business; Why common assumptions about workers are wrong. Why money is a terrible motivator, and people-centered practices that can double productivity.



## SPEED BUMP

Dave Coverly



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