



# Are We There Yet?

Spring 2006

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South Carolina Transportation Technology Transfer Service

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## “We Built It... America Moves On It!”

The Eisenhower Interstate System, which celebrates its 50th anniversary in 2006, has brought about dramatic changes in the lives of all Americans. The story begins with the leadership of two men who shared a grand vision and uncommon sense of purpose.

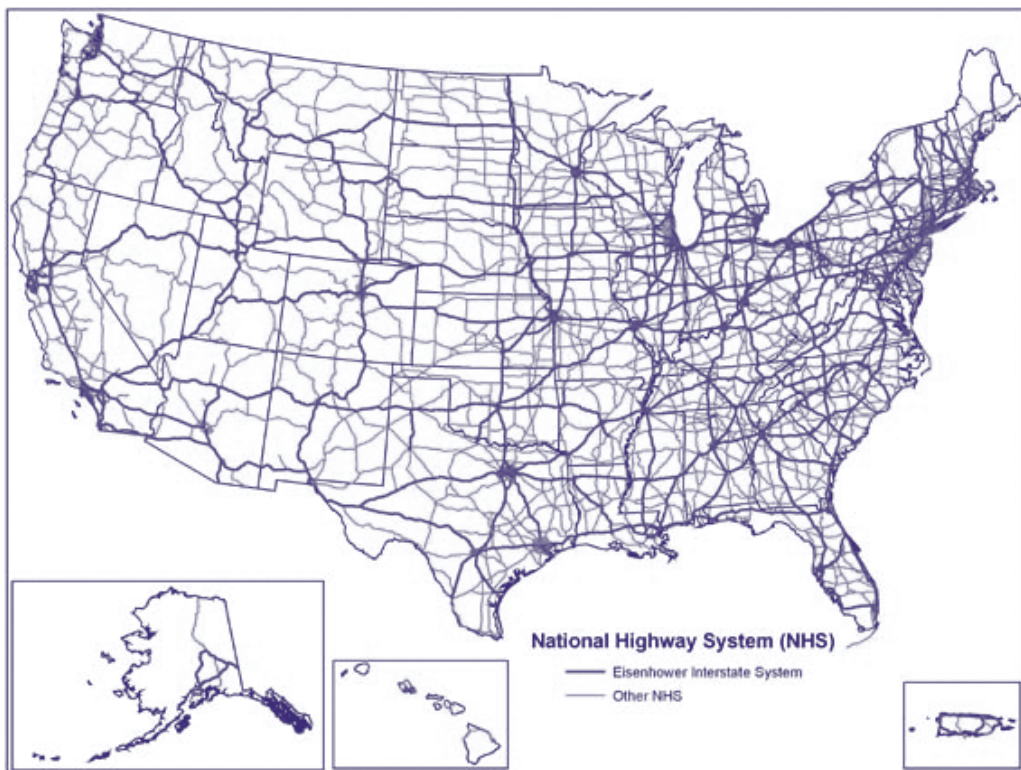
### Michigan’s Earle

One of these great men is unknown to most Americans. He’s Michigan public official Horatio Sawyer Earle. In 1901, Earle sent a letter to 200 influential Americans asking them to join him in New York City at the Cadillac Hotel to form a national road building group.

The goal of the organization, Earle said, would be to advocate federal support for

construction of a “Capital Connecting Government Highway System” that would “connect every state capital with each other and the United States Capital—Washington.” Membership fees for the group, he said, “will be five dollars and the yearly dues five dollars. This is not a cheap affair and cheap members will not be solicited.”

“The organization? The American Road Makers (ARM), which means, it will never lower its arm until its purpose, the Capital Connecting Government Highway, is attained,” Earle proclaimed. Of course, ARM is the predecessor to today’s ARTBA. Earle was likely the first American to put forth a vision for a network of Interstate Highways.



The LTAP Center for South Carolina





**Dwight Eisenhower**

**“Ike”**

Our second visionary man is known and admired by millions of Americans—Dwight David Eisenhower. His views about the need for an Interstate System were shaped by two major experiences.

On July 7, 1919, as a young army

officer, he joined a 3,000 mile cross-country trek from Washington, D.C., to San Francisco over dirt, mud and sand roads. The convoy took 62 days and damaged or destroyed 88 bridges along the way. Eisenhower quickly came to the conclusion that there had to be a better way. As Supreme Commander of Allied Forces during World War II, Eisenhower was stunned by the efficiency and strategic value of Germany’s autobahn.

In the next decade, as president, Ike was determined to build a similar superhighway in the United States. He believed an Interstate Highway System was necessary not

only for military transport and evacuation of cities, but also to help reduce road fatalities and provide the mobility necessary to support a dynamic economy.

**Vision Realized**

On June 29, 1956, President Eisenhower signed the law authorizing construction of the Interstate Highway System and creating the Highway Trust Fund to pay for it.

When the ink dried on that legislation, it represented fulfillment of Eisenhower’s 30-year goal and the greatest domestic achievement of his presidency. It was also the realization of the 1901 vision articulated by ARTBA founder Horatio Earle—and arguably one of the greatest accomplishments ever achieved by a national association.

**ARTBA’s Interstate Game Plan**

Over the next year, ARTBA and our Transportation Development Foundation will roll out a series of educational programs and events designed to focus public attention on the critical role the Interstate Highway System plays in America’s economy, security and quality of life. We’ll spotlight the ARTBA members who helped design, build and maintain the System. National issue and policy forums, education projects, media outreach and research activities are all on the agenda.

This magazine’s special year-long coverage of the Interstate anniversary is outlined in Transportation Builder Editor Carrie Halpern’s column. Our program will be capped with a black-tie dinner hosted by the ARTBA Transportation

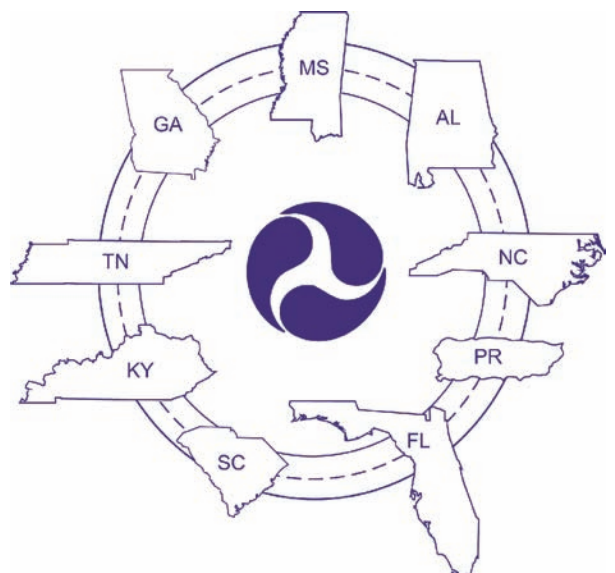
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**Southeastern Local Roads Conference**

The 10th Southeast Local Roads Conference (SELRC) will be held May 21-23 in Chattanooga, Tennessee. The meeting is a collaborative effort of the Federal Highway Administration (FHWA) and the southeast LTAP centers, which include Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Puerto Rico.

The SELRC is targeted to those whose work impacts the movement of persons and goods on local roads. It also provides the opportunity to share success stories and innovative advances in transportation planning, traffic safety operations, roadway design, maintenance, and construction. The tentative agenda for the conference includes a wide array of presentations on local roads topics that will be of interest to city, county, and DOT personnel, as well as local elected officials and private sector employees. There will be two parallel sessions to allow participants a choice of topics.

Registration information will be mailed to you soon and will be available at [www.ces.clemson.edu/t3s](http://www.ces.clemson.edu/t3s).





# Transportation Challenges Faced by People with Disabilities in Small Communities are Identified

by Russel Thatcher

The ESPA contract project “Transportation for Persons with Disabilities in Rural and Small Urban Communities” is documenting best practices in providing ADA compliant transportation for people with disabilities in rural and small urban communities. A nationwide survey of transportation providers and disability agencies was first conducted in early 2005 to identify the major transportation challenges faced by transportation agencies and human services programs in rural and small urban communities as they implement the ADA. A total of 336 surveys were returned and the input from respondents was tabulated. The most significant transportation challenges identified included:

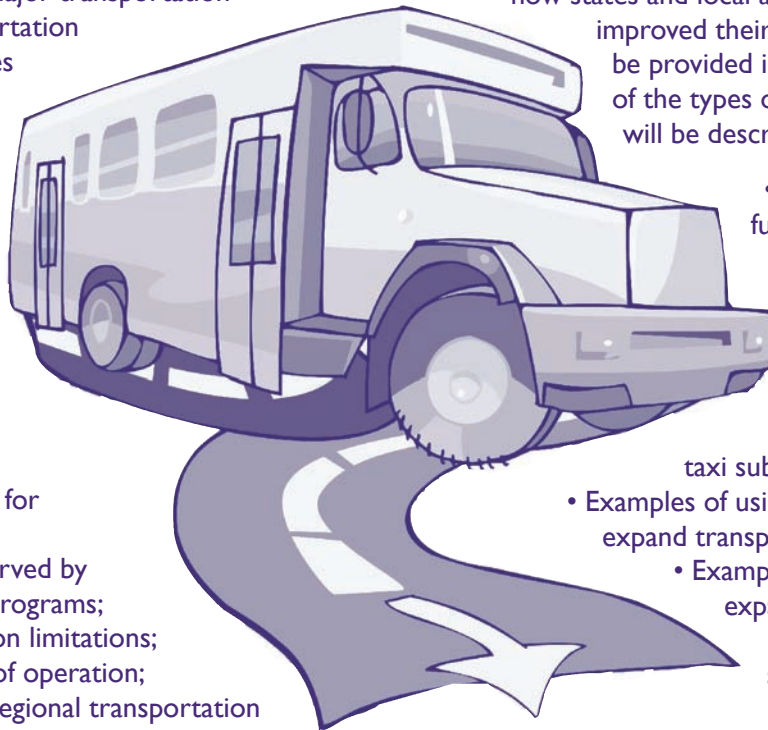
- Limited funding available for transportation;
- Limited trip purposes served by existing transportation programs;
- Client-only transportation limitations;
- Limited days and hours of operation;
- A lack of long-distance, regional transportation services;
- The high cost of transportation due to long trip distances and low population densities;
- A lack of accessible and “equivalent” services for people with disabilities;
- Limited use of advanced technologies;
- A need for improved driver training; and
- A need for information about available transportation services.

Examples of innovative programs that addressed these challenges were then identified. Programs were identified

through a search of available literature as well as through input from survey respondents. More than 80 innovative local and state programs were initially identified, and 20 programs were selected for more in-depth research.

A final report will be prepared in early 2006. The report will offer solutions and approaches for overcoming transportation challenges in rural areas. Examples of how states and local agencies have expanded and improved their transportation services will be provided in “mini-case studies.” Some of the types of innovative programs that will be described include:

- Examples of dedicated state funding for rural transportation programs;
  - Successful flex-route programs;
  - Volunteer driver programs;
  - Voucher programs and taxi subsidy programs;
- Examples of using coordination to expand transportation options;
- Examples of leveraging funding to expand service;
  - Innovative information sharing efforts; and
  - Innovative partnerships for expanding private auto availability.



Information about key federal and state programs, such as United We Ride (see [unitedweride.gov](http://unitedweride.gov)) and contacts for technical assistance will also be included.

For more information, contact ESPA Technical Assistance Contractor Specialist Ken Thompson at [kthompson@easterseals.com](mailto:kthompson@easterseals.com) or 1-800-659-6428.

*Editor's note: Russell Thatcher of TranSystems Corporation is project manager.*

*(cont. from page 2)*

Development Foundation at the Ronald Reagan Building in Washington, D.C. on the 50th Anniversary – June 29, 2006.

## Looking Back... Looking Ahead

The golden Interstate anniversary provides an excellent opportunity to celebrate the enormous positive impacts of the highway system on America. It is also time to look forward and begin laying out a transportation vision for the next 50 years.

“We Built It...America Moves On It!” We hope you will join us for the ride in the year ahead!

*This article first appeared in the Summer 2005 issue of Transportation Builder magazine. Reprinted with permission from the American Road & Transportation Builders Association.*

# Upgrade for the Digital Work Zone

## QuickZone now handles more complex projects and more performance measures

By Deborah Curtis

With road repair and rehabilitation projects on the rise across the country, reducing traffic delays caused by work zones and improving mobility is more important than ever. It is estimated that work zones account for nearly 24% of nonrecurring motorist delay, with work zones cited as second only to poor traffic flow as a source of traveler dissatisfaction.

To improve work-zone planning, Federal Highway Administration (FHWA) released the QuickZone software in 2002. Since then, the program has been used by state and local highway agencies and construction contractors to compare the traffic effects for work-zone mitigation strategies and to estimate the resulting costs, traffic delays, and potential backups. Now the debut of the enhanced QuickZone 2.0 provides highway agencies and others with an even better work-zone planning tool.

As in the first version of the software, QuickZone 2.0 can be used for such applications as exploring the feasibility of completely closing a road for construction; assessing the effect of delay-mitigation strategies, such as deploying variable message signs; identifying maximum and average user delays by time of day and day of week; scheduling work around seasonal traffic demands; and identifying work that could be scheduled during evening hours. QuickZone 2.0 also incorporates new features that users have asked for:

- Improved two-way, one-lane operations modeling, including modeling of flagger operations;
- Enhanced detour modeling, including tracking of increased travel time on long detour routes;
- Improved ability to model more complex projects, including those with multiple work zones; and
- A wider variety of performance measures that users can track, graph and analyze. These include length of total mainline queue, total mainline delay in vehicle hours, total passenger car costs, total travel time in minutes and detour delay costs. The key measures also can be quickly compared against the conditions before construction.

QuickZone has been used for projects in various stages of development on both rural roads and urban highways. The National Park Service used it, for example, to plan for a major rehabilitation of the main road that runs through Zion National Park in Utah.

A primary concern in the planning was the potential problem for visitors entering the park through the town

of Springdale. Traffic queues often occurred at this visitors entrance even under normal conditions.

QuickZone was used to estimate the length of the queue and number of vehicles in the queue during the peak tourist period of June – October.

The analysis indicated that queues reaching into the town of Springdale would likely occur unless changes were made to the proposed traffic control plan. Because of the QuickZone analysis, project engineers have begun to re-evaluate the construction phasing and propose alternative strategies.

The Tennessee Department of Transportation, meanwhile, used the software to evaluate the feasibility of completely closing a section of I-40 east of Knoxville to perform road work. When QuickZone showed that traffic congestion would likely be significant, further analysis was then done of the predicted problems and options for managing the traffic to prevent lengthy delays.

FHWA's Central Federal Lands Highway Division also used QuickZone to plan for the reconstruction of an 18.6-mile section of the Beartooth Highway in Wyoming. This section had not been rebuilt since the original road construction in 1936.

QuickZone was used to evaluate a series of four planned work-zone areas requiring flaggers, providing an estimate of the cumulative delay a motorist would likely encounter from the series of work zones and allowing for better coordination of lane closures.

QuickZone 2.0 is available for purchase from the McTrans Center (1-800-226-1013 or 352-392-0378; [www.mctrans.ce.ufl.edu](http://www.mctrans.ce.ufl.edu)) or PCTrans (785-864-2599; [www.kutc.ku.edu/cgiwrap/kutc.pctrans/index.php](http://www.kutc.ku.edu/cgiwrap/kutc.pctrans/index.php)). Users of Version 1.0 will receive a free upgrade. ♣

*Curtis is a highway research engineer at FHWA's Turner-Fairbank Highway Research Center, McLean, Va. She can be reached at 202-493-3267; e-mail: [deborah.curtis@fhwa.dot.gov](mailto:deborah.curtis@fhwa.dot.gov).*

*Reprinted with permission from the June 2005 issue of Roads & Bridges. For more information see <http://www.roadsbridges.com>.*

# FHWA Offers Pedestrian Safety Guidelines for Intersections

Of the 4,808 pedestrians killed in 2002 in roadway-related crashes, more than 1,000 died as a result of crashes at intersections. A variety of conditions at intersections can create hazards for pedestrians. The timing of signals may be too brief to permit safe crossing for children, the elderly, and the disabled. Reconstruction projects—including widening streets and adding lanes—improve vehicular efficiency but also can reduce pedestrian safety by increasing the distance that people must walk to cross an intersection. Inadequate lighting, a common problem at rural and suburban intersections, can make it difficult for motorists to see pedestrians. Crash data show that vehicular collisions with pedestrians occur more often with turning vehicles than with straight-through traffic, and left-turning vehicles are involved more often than right-turning traffic.

To improve safety, the Federal Highway Administration's (FHWA) Office of Safety created a comprehensive public awareness campaign targeting both motorists and pedestrians. FHWA designed the campaign to educate pedestrians on how to minimize safety risks and to remind drivers that pedestrians—who also are legitimate road users—should be expected on or near most roadways. The campaign includes a planning guide, a video, public service announcements, posters, brochures, and news releases that states and communities can customize for their use.

More than 150 communities have obtained the campaign planning guide and materials. In addition, FHWA is conducting a study to evaluate the effectiveness of the materials in campaigns underway in Oceanside, California; Washington, D.C.; and Missoula, Montana. The agency made the results of the study available in October 2004.



Campaign information and materials are available at <http://safety.fhwa.dot.gov>.

Reducing the number and severity of pedestrian collisions requires coordination among public authorization, law enforcement



personnel, and transportation engineers. FHWA offers the following guidelines to state and local highway agencies for improving pedestrian safety at intersections:

- Increase visibility. Half of all pedestrian fatalities occur between 6 p.m. and midnight. Add or improve roadway lighting and encourage pedestrians to wear reflective clothing.
- Adjust signals. Consider adding a pedestrian-only phase in the traffic signal cycle. Ensure that the pedestrian signal is visible and that any push buttons used by pedestrians to activate the signal are accessible. When appropriate, supplement signals with audible messages for visually impaired persons.
- Reduce traffic hazards. Restripe crosswalks and stop lines to make them more visible, and provide additional signs where necessary. In addition, use different pavement coloring to delineate pedestrian areas. Install barriers such as fences or shrubs to discourage pedestrians from crossing at unsafe locations, and provide refuge islands on medians so that they can cross one direction of traffic at a time.
- Improve crosswalks. Embed flashing lights in the pavement and install flashing “Pedestrian Crossing” signs that alert oncoming traffic to pedestrians in the crosswalk.
- Enforce laws. Focus on reducing speeding through intersections, and enforce motorist compliance with pedestrian safety laws and pedestrian compliance with signals and appropriate crossing locations.

For more information on FHWA's pedestrian safety campaign and measures to enhance intersection safety, contact Tamara Redmon, 202-366-4077, [tamara.redmon@fhwa.dot.gov](mailto:tamara.redmon@fhwa.dot.gov). LTAP

*Reprinted with permission from the Federal Highway Administration's Research and Technology Reporter, June 2004.*



# National Public Works Week

National Public Works Week (NPWW) is a celebration of the tens of thousands of men and women in North America who provide and maintain the infrastructure and services collectively known as public works.

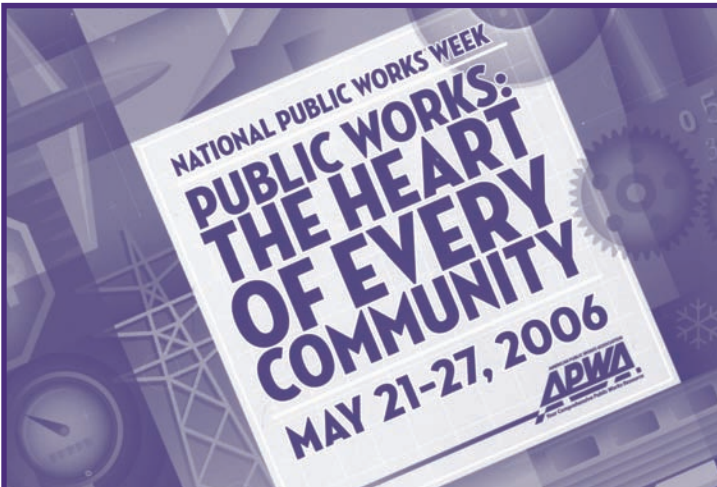
Instituted as a public education campaign by the American Public Works Association (APWA) in 1960, NPWW calls attention to the importance of public works in community life. The Week seeks to enhance the prestige of the often-unsung heroes of our society—the professionals who serve the public good every day with quiet dedication.

APWA encourages public works agencies and professionals to take the opportunity to make their stories known in their communities. Over the years the observances have taken many forms, including parades, displays of public works equipment, high school essay contests, open houses, programs for civic organizations and media events. The occasion is marked each year with scores of resolutions

and proclamations from mayors and governors, as well.

The National Public Works Week How-To Guide at <http://www.apwa.net/About/npww/2006/> is one of several resources the Association makes available to agencies to assist them in the development and implementation of their own individual celebrations. With this tool, an agency will learn how to create proclamations and solicit endorsements from government officials, develop media and press releases, write editorials and articles, and generate material for speeches. There are also several suggestions for celebratory activities to be implemented at the local level.

However you choose to celebrate NPWW this year, APWA is proud to be a resource for you. You deserve the recognition. ▶



# Greenville County Public Works Department Hosts Rover Demonstration

Members of Greenville County Public Works Department recently participated in a joint project with the Transportation Technology Transfer Service (T<sup>3</sup>S) at Clemson University and the Federal Highway Western Lands Division to acquire the demonstration and use of the Rover<sup>®</sup> 500 remote imaging device. The device is a remote controlled vehicle that allows the operator the ability to get real time video images of drain pipes and to gather data to enable the county's engineers and maintenance staff to make fact based decisions on drain systems that would normally require excavation to investigate sources of pipe failure or blockage.

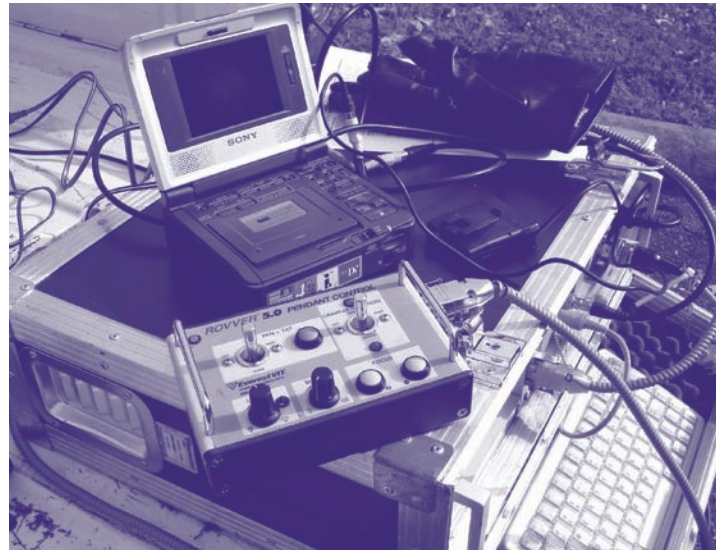
Participants received approximately 36 hours of training on the assembly, deployment, and retrieval of the Rover<sup>®</sup> before placing it in use on some of Greenville County's

most problematic drainage systems. Clemson's T<sup>3</sup>S program announced in the Summer 2005 issue of *Are We There Yet?* the availability of the use of this device, and Ronald Bettis, Principal Engineering Technician, contacted them and was able to reserve the device for use by the Public Works Department.

Dr. Amit Armstrong and Bradley Roberts with FHWA's Vancouver, Washington office coordinated the training and provided the technical analysis of the images that were taken with the Rover<sup>®</sup>. They conducted training that included: hands on experience assembling the various components, understanding of the capabilities of the device, proper deployment and operation, and interpreting the collected data.



Ronald Bettis is setting up the Rover<sup>®</sup> by hooking up the power and video controls



Control device and DVD recording equipment



Willy Wilbur places the Rover<sup>®</sup> in the culvert



Amit Armstrong and Bradley Roberts of FHWA (right) assist Ronald Bettis and Willy Wilbur with Rover<sup>®</sup>

# Safety Zone



## Safety Belts and Rural Communities - 2005 Report



Rural Americans face a greater risk of being injured or killed in a traffic crash than people who live and commute in urban areas. The fact is, only 21 percent of the population lives in rural areas in this country,

yet 39.5 percent of the total vehicle miles traveled are on rural roads. In 2003, rural traffic crashes accounted for 60 percent of the total fatalities on our Nation's highways.<sup>1</sup> Many factors contribute to this, including some that are unique to rural areas. For instance, rural crashes often occur in isolated areas, causing a delay in the time of discovery and in the delivery of emergency services to the victim. Other prominent factors contributing to the high rural crash and fatality rates include alcohol involvement, high-speed crashes, low safety belt use, vehicle rollovers, and ejections.

Although safety belt use in rural areas increased to 76 percent in 2004,\* it remains slightly lower than the national rate (80 percent).<sup>2</sup> The lower rate may be attributable to the lower use of safety belts among pickup truck occupants in rural areas (62 percent in 2003), a common mode of transportation.<sup>3</sup>

Along with pickup truck occupants, another high-risk group is 15- to 20-year-olds. Motor vehicle crashes are the leading cause of death for 15- to 20-year-olds. In 2003, 7,884 15- to 20-year-old drivers were involved in fatal crashes, 3,657 were killed, and an additional 308,000 were injured.<sup>4</sup> Almost twice as many vehicle occupants in this age group died in rural area crashes compared to urban crashes. Sixty percent of these young people who died in rural area crashes were unrestrained, compared to 52 percent in urban areas and 51 percent of the total for all age groups.<sup>5</sup> To achieve further gains in rural safety belt use, campaigns will need to focus more directly on rural

communities and among these high-risk groups within those communities.

### Rural Communities Are at Risk

- In 2003, 25,383 people died in motor vehicle crashes in rural areas.<sup>6</sup>
- The motor vehicle fatality rate in rural areas is more than double the fatality rate in urban areas. In 2003, the fatality rate in rural areas was 2.3 fatalities per 100 million vehicle miles traveled (VMT) vs. 1.0 fatality per 100 million VMT in urban areas.<sup>7</sup>
- In 2003, more fatally injured occupants were ejected from vehicles in fatal rural crashes compared to fatal urban crashes.<sup>8</sup> See the table below.

Percent Fatal Passenger Vehicle Occupant Ejections in 2003 Source: Fatality Analysis Reporting System (FARS) 2003		
(Rural vs. Urban Fatal Crashes)		
Type of Vehicle	Rural Crashes	Urban Crashes
All Passenger Vehicles	30%	21%
Sport Utility Vehicles (SUVs)	48%	40%
Pickup Trucks	38%	29%

- Of those rural fatalities involving ejections, 87 percent of the SUV occupants were unbelted and 92 percent of the pickup truck occupants were unbelted.<sup>9</sup>
- Over 70 percent of the fatal crashes on roadways with posted speeds of 55 mph or higher occurred in rural areas.<sup>10</sup>
- In fatal single-vehicle crashes in 2003, over half (59 percent or 7,650) of the vehicles ran off the road in rural areas, versus 38 percent (or 3,287) in urban areas.<sup>11</sup>

\* Note: The majority of data for this fact sheet is from 2003, which is the latest year available at the time of publication. In some instances 2004 data was available and was included.

See <http://www.nhtsa.gov/people/injury/airbags/BUASBRural2005/index.html> for references.



# Staying Healthy in the Work Zone



## Working in the Heat

Working with heavy equipment in a tight space close to moving traffic may be a more obvious hazard to your safety, but the heat can be equally as dangerous. Too much heat can make

you tired, hurt your job performance, increase your chance of injury—even kill you. Road crews often work outdoors in high temperatures, under full sun, in high humidity, and with light or no wind while wearing heavy or restrictive protective gear and laboring under intense physical exertion—the perfect combination for heat-related illnesses to strike.

Road crew workers need to know how to protect themselves from heat-related illnesses, how to recognize the symptoms in themselves and others, and how to respond if someone else on the crew suffers from a heat-related illness.

## Heat-Related Illnesses

When you work in a hot environment and your body temperature increases, it attempts to maintain its normal temperature, transferring heat back into the environment by sweating. The hotter it gets around you, the harder your body works to stay cool; when it has absorbed more heat than it can naturally dissipate, and it can't keep up, heat related illnesses can strike. Heat related illnesses can range from mild prickly heat, muscle cramps and swelling, to severe heat exhaustion and heat stroke.

## Prevention

For road crews, hot work environments are part of the job, but heat-related illnesses don't need to be. Most heat-related illnesses can be prevented by keeping the body cool and well-hydrated.

**Drink up.** Before work begins, drink water until you feel full. Then, as often as every 15 minutes, drink another cup (5 to 7 ounces) of water, fruit juice, or sports drink. Keep drinking all day.

**Rest often.** Cool down by resting in a cool, shady spot or an air conditioned space, if possible. Taking a rest and decreasing your level of exertion, will help cool you down. If you are working in protective clothing, you may need

even more rest breaks.

**Keep your shirt on.** Wear light-colored, loose-fitting, breathable clothing, if the work rules allow. Sweat soaked clothes cool you better than your bare skin. Choose and use the hard-hat with the widest brim. (And, don't forget to use sunscreen.)

**Skip the salt.** Don't use salt tablets: they keep fluids in your stomach longer, leaving less fluid available for necessary sweat production. Your body requires even more water to get rid of the extra salt, increasing the amount of work your kidneys must do, and raising the risks of dehydration and high blood pressure.

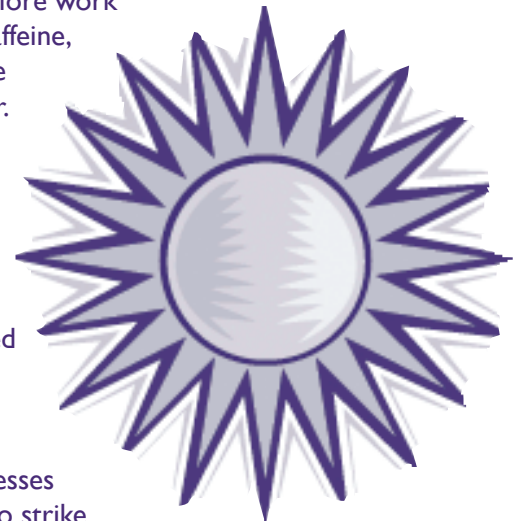
**Work smarter.** Encourage your boss to plan the job so that the heaviest work is done during the coolest time of day. Work in the shade whenever possible; a simple awning or canopy blocking the sun will go a long way toward keeping you cooler.

**Treat yourself right.** Sufficient sleep and good nutrition are important for maintaining a high level of heat tolerance. Eat smaller meals before work activity. Avoid caffeine, alcohol, and large amounts of sugar.

Gradual exposure to heat gives the body time to become more accustomed to higher environmental temperatures.

Heat related illnesses are more likely to strike workers who have been away from hot environments and have become accustomed to lower temperatures, such as those returning to work following a vacation in a cooler climate, an extended illness, or indoor work duty. Workers who have otherwise not had time to adjust to the heat, such as those working during a sudden heat wave, also face greater risk.

Many conditions, medications and diseases interfere with the body's ability to regulate temperature and get rid of heat. Anyone taking medications (over-the-counter or by prescription) or suffering from a chronic illness or disease should consult a health professional to learn more about their risk for heat-related illnesses. Workers who may be at



(cont. on page 10)

a greater risk of heat illnesses are the obese, the recently ill, and older individuals. Tobacco use and alcohol or drug abuse and withdrawal can interfere with the body's ability to cool itself.

## Signs, Symptoms and Treatment

Home treatment is usually all that is needed to treat a mild heat-related illness. Heat rash can be treated with antihistamines, to relieve the swelling and itching, as long as no other heat-related symptoms are present. Heat cramps are treated by getting out of the heat and replacing fluids and salt with a rehydration or sports drink (but not with salt tablets, see more on salt tablets above). Swelling is treated with rest and by elevating the legs. Fainting usually doesn't last long; once the person lies down flat, preferably in a cooler location, the condition usually improves.

The first warning signs of more severe heat stress are sluggishness and a foggy feeling. The condition worsens as the body loses fluids through sweat. Cramps, dizziness, and fainting follow, leading to the most severe heat-induced illnesses: heat exhaustion and heat stroke.



Recognize the symptoms of heat exhaustion: excessive sweating; pale, cool, moist, clammy skin; headache; fatigue; blurred vision; feeling faint, lightheaded, dizzy or weak; mood change such as

irritability, confusion, restlessness or anxiety; nausea or vomiting; decreased or dark colored urine; and fast heart rate and breathing.

Treat heat exhaustion by moving the victim to a cool place, in the shade or indoors. Apply cool, wet cloths and fan the victim, but stop if the person develops goose bumps or shivers. Rehydrate slowly with about one-half cup of water every 15 minutes. Total rehydration with oral fluids usually takes about 36 hours, but most people begin to feel better within a few hours and should rest at least 24 hours. If left untreated, heat exhaustion could progress to heat stroke and possible death. Heat stroke causes severe dehydration and can cause body organs to stop functioning. Heat stroke occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached.

Recognize the symptoms of heat stroke: dry, pale skin with no sweating; hot, red, dry skin that looks sunburned;

mood changes such as irritability, confusion, restlessness or anxiety; seizures; and unconsciousness for longer than a minute.

Any person with symptoms of heat stroke requires immediate hospitalization. Call for help, then cool the person as quickly as possible by whatever means possible. While waiting for the ambulance to arrive, move the victim into the shade or air conditioning, soak the victim's clothing with water and vigorously fan the body to increase the cooling effect. If the person is awake and alert enough to swallow, give the person fluids for hydration.

*Reprinted with permission from the Tech Transfer, Summer 2004, quarterly newsletter of the California LTAP Center*

## Water, Water Everywhere

Some interesting facts about water, which we take for granted - until we run out:

- One gallon of water weighs about 8.3 pounds.
- 75 percent of the Earth's surface is covered in water.
- 97 percent of the Earth's water is in the oceans; another 2 percent is in ice caps and glaciers, leaving only 1 percent available for human consumption.
- Each day, the sun evaporates 1 trillion tons of water.
- Sound travels four times faster through water than through air.
- The average American uses 50 gallons of water a day. During medieval times in Europe, the average was five gallons.
- The human body is 65 percent water (a cucumber is 95 percent).
- A person can survive without food for a month but only five to seven days without water.



# 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.

## Transportation Technology Transfer Service

Civil Engineering Department      Phone: 864-656-1456  
Clemson University, Box 340911      Toll free: 888-414-3069  
Clemson, SC 29634-0911      Fax: 864-656-2670

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

This is a new address

Please add my name to your mailing list

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## Publications

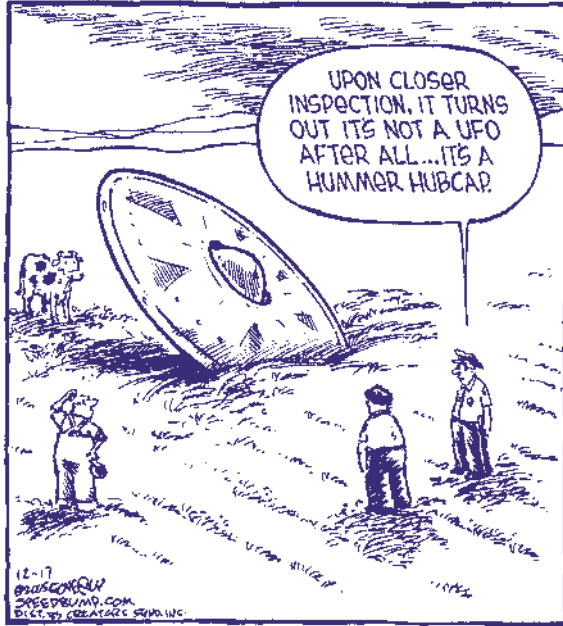
- Guide for the Planning, Design, and Operation of Pedestrian Facilities*, AASHTO  
Provides guidance on the planning, design, and operation of pedestrian facilities along streets and highways. Specifically, the guide focuses on identifying effective measures for accommodating pedestrians on public rights-of-way. ( This publication is for loan only)
- Gravel Road Maintenance: Meeting the Challenge* (DVD)  
Shows maintenance workers, supervisors, and engineers the right way to perform gravel road maintenance. (This publication is for loan only)
- Worker and Workplace Safety Tips Sheets*, University of Minnesota (LTAP),  
“Abrasive Wheel Machinery and Tools”, “Fleet Safety—Backing Accidents”, “Forklift Operation”, “Heat Stress”, “Ladders, Safe Lifting Techniques”, “Medical Services at Construction Job Sites”, “Personal Fall Protection—The Basics”, “Scaffolding 101—The Basics”, “Excavation Requirements.”
- Minnesota Snow and Ice Control Handbook* (Manual and DVD)  
Describes the tools, best practices and limitations for snow and ice control. Explains when to use and when to use these tools and practices
- Advances in Self-Consolidating Concrete* (FHWA Focus) – article
- FHWA Retroreflective Sheeting Identification Guide*, FHWA  
Covers retroreflective sheeting materials for rigid sign surfaces made with glass beads and prisms. Also covers retroreflective sheeting materials for non-signing applications and flexible signs.

## DVD

- Preventive Maintenance and Surfacing Systems*, DVD ONLY:  
Explains advantages, benefits, and economics of Pavement Preservation and Slurry System preventive maintenance treatments for existing asphalt roadways. (2 programs)
- Flagging in the Work Zone: Safety in Your Hands* DVD ONLY:  
Covers proper flagging practices and Techniques that help make work zones safer for flaggers, workers and roadway users.
- Contractor Safety: It's Everybody's Business* DVD ONLY:  
This program focuses on various specific hazards including slips, trips and falls; fire safety; personal protective equipment; confined space entry; trenching and shoring; lockout/tagout; hotwork; chemical process safety; and working with hazardous chemicals.

## SPEED BUMP

Dave Coverly



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