THE UNIVERSITY OF NORTH CAROLINA
HIGHWAY SAFETY RESEARCH CENTER

DIRECTIONS

SAFETY • MOBILITY • INFORMATION

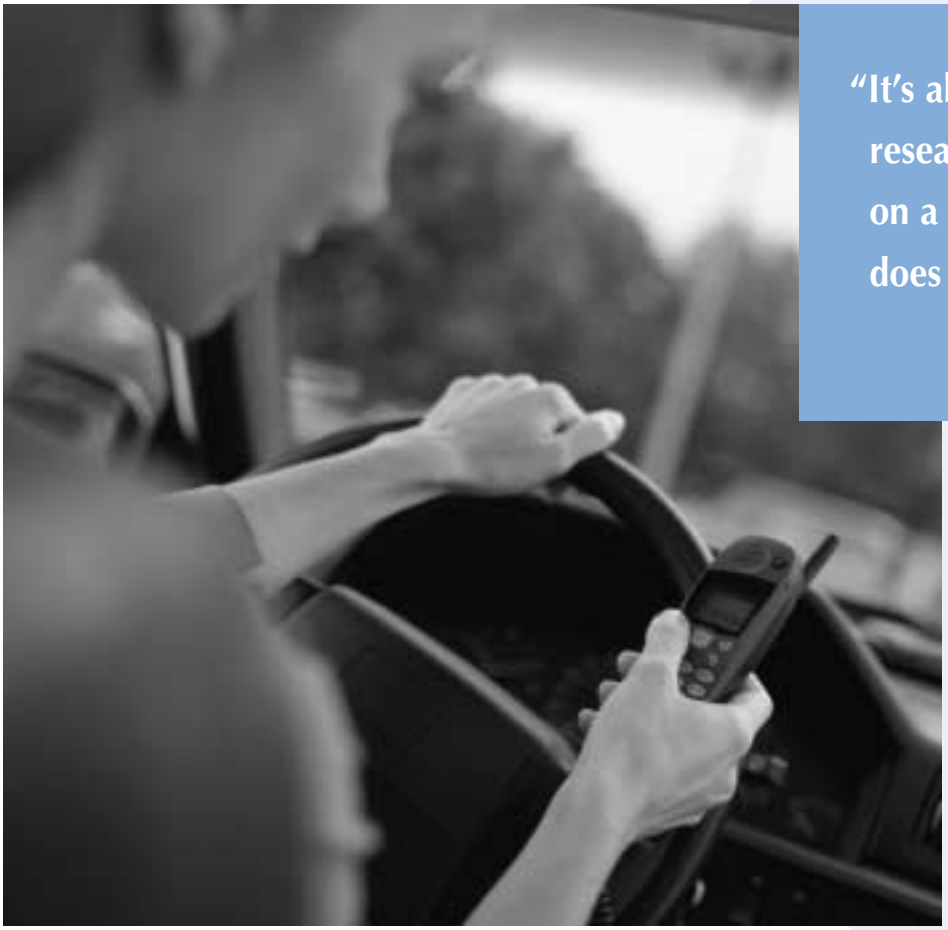
INSIDE

A Newsletter of the University of North Carolina Highway Safety Research Center

Spring 2002 Volume VI, Number 4

Cell Phones & Driving:

How Dangerous is the Combination?



> **"It's absolutely clear from the research literature that talking on a cell phone while driving does elevate the risk of a crash."**
>
> *Dr. Donald Reinfurt*

In 2001, at least 144 cell phone-related bills were considered in 44 state legislatures, the District of Columbia and Puerto Rico. In November of 2001, New York state banned the use of hand-held mobile phones by drivers except in the case of an emergency.

As the popularity of cell phones continues to grow, so does the legislation surrounding their use while driving. But how dangerous is it to drive and use a cell phone? How many people are talking on cell phones while driving and how many crashes are related to cell phone use? That is what researchers at the UNC Highway Safety Research Center are working to find out.

To explore the issue, Dr. Donald Reinfurt, former deputy director of the UNC Highway Safety Research Center (HSRC), and his colleagues recently conducted a study of cell phone use among North Carolina drivers. The study was conducted with the support of the North Carolina Governor's Highway Safety Program and the cooperation of Col. Richard Holden, commander of the North Carolina State Highway Patrol.

HSRC researchers first reviewed recent research on driving and cell phone use, case analyses of phone-related crashes and driver performance studies.

"It's absolutely clear from the research literature that talking on a cell phone while driving does elevate the risk of a crash," Reinfurt said. "Using cell phones slows reaction times and degrades drivers' tracking abilities. But there is wide disagreement about the magnitude of that increased risk and whether hands-free cell phone use is safer than hand-held."

The second part of the study consisted of reporting on recent legislative activity regarding the use of cell phones while driving. As of Aug. 24, 2001, 44 states had considered legislation related to cell phone use while driving, compared to just 15 states in 1999. In addition, 13 counties and municipalities in the United States had passed restrictions that require motorists to use hands-free devices while driving.

Next, HSRC researchers set out to determine the characteristics of North Carolina drivers who use hand-held cell phones when driving. Traffic monitors observed drivers during daylight at 85 sites across the state. A total of 11,286 moving vehicles were observed. Of those, 352 drivers were using a cell phone.

That means that at any given time, 3.1 percent of people on the roads in North Carolina are talking on cell phones while driving. The Piedmont area had the highest cell phone use while driving – 4.1 percent. The prevalence rate was 2.2 percent in the mountains and 1.5 percent in the coastal plain.

These numbers are consistent with a recent National Highway Traffic Safety Administration study that showed 3 percent of drivers nationally are talking on cell phones at any given time, Reinfurt said. That translates into 500,000 drivers nationally.

In addition to the 11,286 moving vehicles, traffic monitors also observed 14,059 passenger vehicles that were stopped at intersections at the 85 sites across the state. They noted whether each driver was talking on a cell phone, and they also recorded the age, sex, race, restraint use, type of vehicle, number of occupants in the front seat and rear seats and whether each vehicle had a North Carolina license plate.

"From this sample, we found that drivers who were using a cell phone were more likely to be driving without a front seat passenger, driving a sport utility vehicle, younger, white and using a seat belt," Reinfurt said.

HSRC researchers also examined the involvement and circumstances pertaining to cell phone use in crashes in North Carolina. A pilot study was conducted with the North Carolina State Highway Patrol where investigating troopers completed a special form for crashes where a cell phone was involved. Over a two-month period involving three troops from the State Highway Patrol, there were a total of eleven crashes out of 6,686 in which a cell phone appeared to play a role in the crash. In other words, about one in 600 crashes in the study appeared to involve the use of a cell phone while driving.

A computer search of all North Carolina crash report narratives between Jan. 1, 1996, and Aug. 31, 2000, revealed that the frequency with which cell phone use was mentioned had skyrocketed – from 22 in 1996 to 231 for the first eight months of 2000.

"We believe that cell phones are actually involved in many more crashes than we found," Reinfurt said. "Because drivers usually won't admit to officers that they were talking on phones at the time of their crashes, studies analyzing risk are notoriously difficult to do well, and thus it is far from clear just how much cell phones increase the risk of crashes. We are a long way from answering this question."

To further explore the use of cell phones while driving, HSRC's Dr. Jane Stutts is planning a statewide telephone survey this spring. The survey will gather data to help determine the characteristics of drivers that are using cell phones while driving. Randomly-selected respondents will also be asked about their attitudes toward using cell phones when driving and potential legislation related to cell phone use.

Stutts will also be talking to Highway Patrol personnel in several states to determine if any state has found a way to collect better data on cell phone-related crashes. In North Carolina, Stutts will be working with the North Carolina State Highway Patrol to collect more detailed data on the frequency and characteristics of crashes involving cell phones. The special cell phone-related form that Troopers used previously will be revised and will be used more widely across the state.

The revised cell phone-related form will likely include space to also record use of other new in-vehicle electronic technologies, such as satellite navigation systems.

> **"Cell phones are just the tip of the iceburg for what may be in our cars in the future."**
>
> *Dr. Jane Stutts*

"We really need to get a good handle on just what the safety implications may be for all new technologies people are using in their cars these days," Stutts said. "We need to learn more about how people are using them in real-world situations, looking both at technologies installed in the vehicle and those brought into the vehicle from outside, such as laptops and cell phones."

Although cell phones are just one of several distractions that can lead to crashes while driving, it is justified that researchers are focusing on them, Stutts said.

"Whereas many distractions, such as drinking and eating while driving, have been with us forever, cell phones are relatively new," she said. "And cell phones are just the tip of the iceberg for what may be in our cars in the future."

Find the full text of the report, "Cell Phone Use While Driving in North Carolina," at: http://www.hsrc.unc.edu/pdf/2001/cellphone.pdf

WHAT DISTRACTS DRIVERS?

In the first phase of a major study for the AAA Foundation for Traffic Safety, HSRC's Dr. Jane Stutts examined all forms of distractions to drivers, including children, radios, food and beverage consumption, cell phones, and occurrences outside the vehicle. The initial report found that cell phone use is just one of numerous non-driving activities that can lead to crashes.

By analyzing five years of data (1995-1999) from the National Highway Traffic Safety Administration's Crashworthiness Data System, researchers found that 15 percent of drivers in the study were not paying attention and just over half of these (8.3 percent) were distracted by something inside or outside the vehicle. When drivers with unknown attention status were removed from the data, the percentage of distracted drivers rose from 8.3 to 12.9 percent.

The specific sources of distraction among those drivers who were judged to be distracted at the time of the crash are shown, in order of frequency, in the chart to the right.

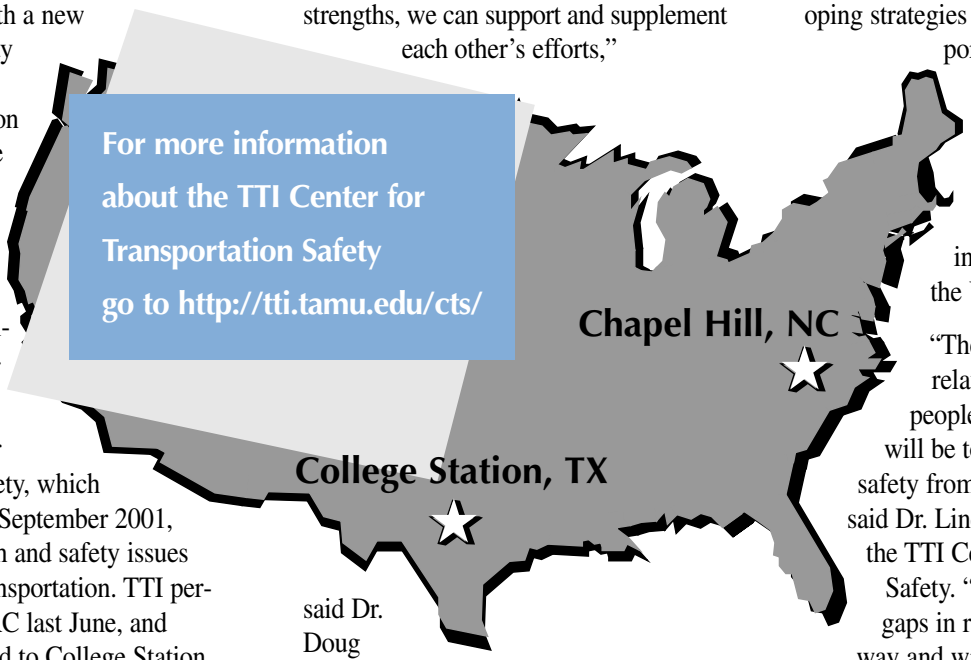
However, before using the data from this study, it is important to understand the purpose of this particular analysis and the limitations of the data, Stutts said.

HSRC to Work with New Texas A&M University Safety Center

The UNC Highway Safety Research Center (HSRC) has established a working relationship with a new transportation safety center at A&M's Texas Transportation Institute (TTI). The two centers expect to collaborate on a variety of projects, including new initiatives and amplification of work currently underway.

The TTI Center for Transportation Safety, which was established in September 2001, will focus on health and safety issues associated with transportation. TTI personnel visited HSRC last June, and HSRC staff traveled to College Station, Texas, in July and November.

"Although there is some overlap in our expertise and capability, each center has a number of complementary areas that don't overlap. By combining our centers' strengths, we can support and supplement each other's efforts," said Dr. Doug Robertson, director of HSRC.



For more information about the TTI Center for Transportation Safety go to http://tti.tamu.edu/cts/

Both the TTI Center for Transportation Safety and HSRC are focused on identifying and conducting research that will enhance transportation safety and developing strategies to help implement transportation safety research findings. Both centers share the same end goal – reducing the number of transportation-related deaths and injuries that occur across the United States each year.

"The center will house a relatively small group of people whose primary mission will be to work in transportation safety from different perspectives," said Dr. Lindsay Griffin, director of the TTI Center for Transportation Safety. "We will identify and fill gaps in research already underway and will coordinate and promote safety projects throughout TTI as well as with other partners already studying transportation safety issues."

SPECIFIC DISTRACTION	PERCENT OF DISTRACTED DRIVERS
Outside person, object or event	29.4
Adjusting radio, cassette, CD	11.4
Other occupant in vehicle	10.9
Moving object in vehicle	4.3
Other device/object brought into vehicle	2.9
Adjusting vehicle/climate control	2.8
Eating or drinking	1.7
Using/dialing cell phone	1.5
Smoking related	0.9
Other distraction	25.6
Unknown distraction	8.6

"This research was done to help guide future research - to provide input for future data collection," she said. "In 36 percent of the crashes we looked at, the driver's attention status was unknown, which means that all distractions in general were under-reported. And we feel that it's very likely that some distractions were under-reported more than others."

Cell phone use is one distraction Stutts feels is underestimated.

"People may have learned that if you're in a crash when you are talking on a cell phone, it's not a good idea to tell that to the officer reporting the crash," she said. "It seems that other distractions, such as attending to a crying child or being distracted by a spilled drink, are much more socially acceptable to identify as a factor in a crash."

Better data collection from real-world situations is needed, Stutts said. She is currently working on the second phase of the study.

"Even though we have some information on which distractions actually may cause crashes, we can't really say whether or not a particular distraction is more risky than another unless we have some feeling for how often people engage in these different behaviors," Stutts said. "So what we are trying to do, along with the distraction data, is to collect some exposure data that can give us a better feel for just how often people engage in these different behaviors."

Two Long-Time HSRC Staff Members Retire

Two long-time staff members at the UNC Highway Safety Research Center (HSRC) retired in December. Both Dr. Donald W. Reinfurt, who was the deputy director of the Center, and Dr. J. Richard Stewart have worked at HSRC for more than 30 years. Both are statisticians by profession and have been instrumental in building the Center's international reputation for excellence in the analysis of data from motor vehicle crash records.

Although Reinfurt and Stewart will be missed, these distinguished scientists leave a legacy of research and accomplishments that have contributed to moving forward public policy regarding highway safety issues, and as a result, saved lives.

Dr. Donald W. Reinfurt

A love of mathematics, and a determination to use his talents in public service led Reinfurt to focus his graduate studies on applied math and statistics. Reinfurt credits an early mentor, Dr. Gary Koch of the Department of Biostatistics in the UNC School of Public Health, with guiding him in his career.

In 1968 while a doctoral student in biostatistics at the University of North Carolina at Chapel Hill, Reinfurt took a graduate student job at HSRC. He stayed for more than 33 years.

"It was an excellent chance to apply my doctoral training in statistics to real-world problems on the highways," Reinfurt said.

WORKING TO SAVE LIVES

Much of Reinfurt's work at the Center has focused on collaborating with the North Carolina Division of Motor Vehicles, North Carolina Governor's Highway Safety Program, law enforcement, and other state agencies to improve crash data systems. Whenever a motor vehicle crash occurs, law enforcement officers collect information on the crash. Reinfurt has worked steadfastly to improve North Carolina's crash report form and educate police officers on how to complete the form so the data would be more useful for conducting research that could save lives.

"It was not very glamorous work and did not get a lot of publicity, but it was essential and underpins everything else we do," said Dr. Patricia Waller, a colleague of Dr. Reinfurt for more than 20 years at HSRC. "If you don't have good data, it doesn't matter what kind of programs you have out there, you have no idea how effective they are."

Reinfurt was also "central" in terms of evaluating the effectiveness of North Carolina's seat belt laws, according to

> **"I fell in love with the field quite simply because it's something that affects virtually everyone."**
>
> *Dr. Donald Reinfurt*

Dr. Donald Reinfurt, 1979

Dr. B.J. Campbell, the founding director of HSRC. As part of this project, Reinfurt helped with the evaluation of the effectiveness of the state's "Click It or Ticket" campaign – an educational/enforcement program that began in 1993 and succeeded in raising seat belt rates in North Carolina from 65 percent to more than 80 percent.

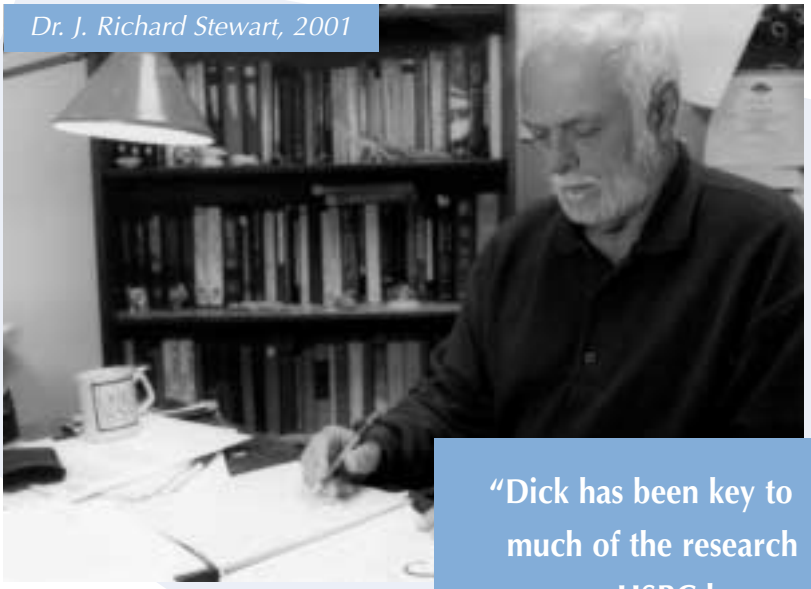
Other areas of research specialty for Reinfurt include crash research methodology that focuses on developing ways to perform statistically sound crash studies; seat-belt and air-bag safety and effectiveness; motor-vehicle crashworthiness; sports utility vehicle safety; and the emerging issue of cell phone use while driving.

NOT CAMERA SHY

Because of his knowledge of a broad spectrum of transportation issues and his ability to translate research results for a variety of audiences, Reinfurt has frequently been called upon to testify before the North Carolina General Assembly regarding pending legislation. He was also an important resource for local, state, national and international media – a task he found enjoyable.

"I tried to use news interviews to educate the public about the realities behind sensational stories," Reinfurt said. "Media interviews help reach a broader audience than reports, and they were an opportunity to provide reliable information to the public."

Dr. Donald Reinfurt, 2001



Dr. J. Richard Stewart, 2001

Dr. J. Richard Stewart

For the past two years, Dr. J. Richard Stewart, HSRC's senior statistician, has been "partly retired." Stewart continued to work part time at HSRC on several continuing research projects, including the Highway Safety Information System (HSIS), an information system that is comprised of crash roadway and traffic data from eight states and allows for the analysis of crashes as they relate to roadway design. In December, Stewart decided it was time to completely retire.

Stewart began working at HSRC in the fall of 1970. As a talented statistician, HSRC has relied heavily upon Stewart to analyze data for countless projects. Among other things, Stewart has been involved in projects estimating the effects of seat belts, analyzing the effects of alcohol in motor vehicle crashes, and assessing the effectiveness of various legislative changes involving motor vehicle use. For example, he helped evaluate the effects of North Carolina's reduction in the legal blood alcohol concentration (BAC) limit from 0.10 percent to .08 percent and the effects of a series of adult and child occupant restraint laws.

"Dick has been key to much of the research success HSRC has experienced over the past 30 years," said Dr. Forrest Council, former HSRC director who continues to work part time at the Center. "Dick is the kind of statistician who is needed in an organization with as many disciplines as we have – one who not only has extensive knowledge of the best statistical methods, but who understands road safety, can help other researchers use these methods correctly, and can write statistical results in such a way that the ultimate user can understand them. That's a great talent."

"Dick has been key to much of the research success HSRC has experienced over the past 30 years."

Dr. Forrest Council, former HSRC director

All of the HSRC staff wish both Reinfurt and Stewart the best of luck and hope they enjoy their retirement. "They have earned it," said HSRC Director Dr. Doug Robertson.

"For more than three decades, Don and Dick have worked relentlessly to improve the quality of data available for transportation safety research and the statistical use of that data," Robertson said. "They have made a tremendous impact on the field of transportation safety, and ultimately on the lives of many highway travelers. Simply put, they cared, and their expertise and commitment to saving lives will be missed." D

Building Pedestrian-Friendly Communities

NEW GUIDE GIVES PLANNERS, ENGINEERS, AND OFFICIALS TOOLS THEY NEED TO CREATE SAFE AND HEALTHY WALKING ENVIRONMENTS.

In the past, it often took a tragic traffic-related death or injury before a community would make improvements for pedestrians such as building sidewalks, installing safe pedestrian crossings, and providing safe routes to school.

But that is changing, according to researchers at the Pedestrian and Bicycle Information Center (PBIC), a center within the UNC Highway Safety Research Center.

"People want to live in healthy communities where they can walk, bicycle, and socialize," said Charles Zegeer, director of the PBIC. "In the quest to build sophisticated transportation systems many transportation engineers and planners overlooked the most basic form of transportation–walking. Now citizens are demanding they go back and make improvements."

In an effort to help communities create pedestrian-friendly environments, researchers at the PBIC have released the "Pedestrian Facilities User Guide." Created as part of a Federal Highway Administration Study, the guide contains useful information regarding the main causes of pedestrian crashes and ways to counter them, how to create walking environments, and engineering improvements that can be made to improve the quality of life for all citizens. The guide is available online at www.walkinginfo.org.

In 2000, approximately 4,739 pedestrians were reported to have been killed in motor vehicle crashes in the United States. That translates to 11.3 percent of the total motor vehicle deaths nationwide that year. An additional 78,000 pedestrians were injured in motor vehicle collisions.

Traditionally pedestrian-related safety problems have been addressed by analyzing police crash reports, and improvements have been made only after warranted by crash numbers, said Zegeer. The "Pedestrian Facilities User Guide" helps planners and engineers be proactive and identify safety problems in an area before crashes occur, as well as to select treatments for sites that have pedestrian crash problems.

Types of pedestrian crashes fall into 12 specific groups. The guide provides a matrix of 47 engineering treatments that are possible countermeasures for various crash groups. Following the matrix is a detailed description of each crash group, its potential causes and suggested countermeasures. The guide also provides the purpose, considerations, and estimated cost for each countermeasure suggested.

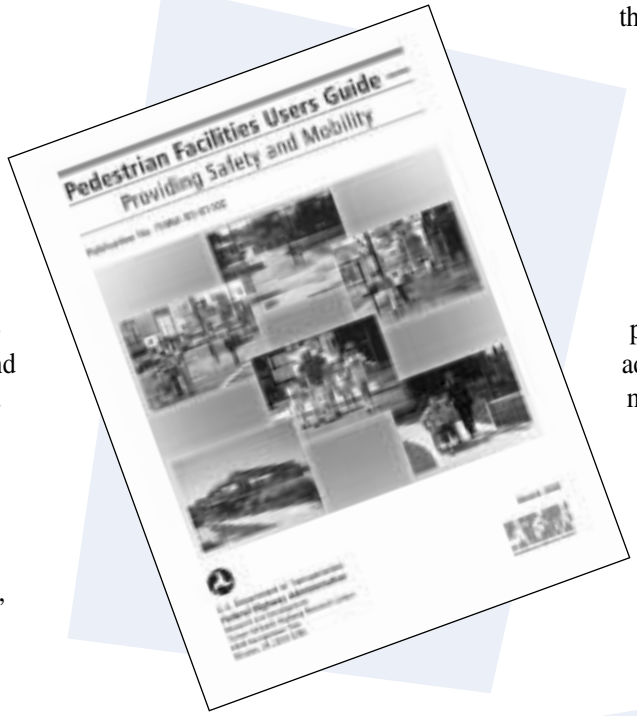
For example, if a city is having a problem with school children crossing at an intersection where vehicles are turning,

transportation engineers could use the guide to identify eight potential ways to solve the problem. Engineers could then read about each of these eight countermeasures, determine which would work best, and get an estimate of what the improvements will cost.

The guide also contains case studies from communities across the United States, such as Asheville, N.C., Cambridge, Mass., Boulder, Col., Fort Pierce, Fla., and Portland, Ore., that have successfully made improvements for pedestrians. These improvements include calming traffic and reducing speeds through neighborhoods, revitalizing downtown areas, and improving safety for kids near schools.

For transportation engineers and planners looking to build sidewalks, walkways, and safe street crossings, guidelines for installation are also included.

"The 'Pedestrian Facilities User Guide' gives citizens and local officials the information they need and want in a format that is readable and easy to understand," said Peter Lagerwey, pedestrian and bicycle coordinator for the city of Seattle and one of the guide's authors. "This guide combines a lot of widely dispersed, existing information with some new ideas to create a 'one stop shopping' manual that up to now has not existed."



Established in June 1999, the mission of the Pedestrian and Bicycle Information Center is to improve the quality of life in communities through the promotion of safe walking and bicycling as a means of transportation and physical activity. The Center serves anyone interested in pedestrian and bicycle issues, including planners, engineers, private citizens, advocates, educators, law enforcement and the health community.

"Given all the health benefits of walking, every community should examine its walking environment and look at this guide to determine what improvements could be made to make their streets safer and more friendly for pedestrians,"

Charles Zegeer, lead author of the "Pedestrian Facilities User Guide"

HSRC Research Bibliography Available Online

From distracted drivers to pedestrian safety, UNC Highway Safety Research Center (HSRC) researchers published reports and studies on a wide variety of topics in 2000. To see a comprehensive list of work published by HSRC staff, just visit the publications section on HSRC's website.

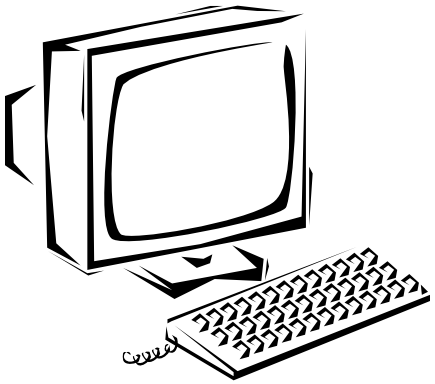
The URL is:
http://www.hsrc.unc.edu/publications/publications1.htm

The publications page is updated frequently by HSRC Librarian Mary Ellen Tucker. Links to the full-text of reports and articles are provided whenever possible. Full-text versions of many research reports are available for download. Copyrighted publications are cited with ordering information.

Among the topics of research published in 2000 are:

- cell phone use while driving
- older drivers and pedestrians
- graduated drivers licenses
- distracted drivers
- cable median barriers
- commercial vehicle safety
- drinking & boating
- pedestrian safety

http://www.hsrc.unc.edu/publications/publications1.htm



HSIS Wins National Traffic Records Award

HSRC is proud to announce that the Highway Safety Information System (HSIS) took top honors in the Best Practices in Traffic Records competition at the National Safety Council's International Traffic Records Forum last July.

HSIS is the only national database that incorporates and links crash data with roadway inventory and traffic data so that safety effects of roadway design can be studied. Sponsored by the Federal Highway Administration (FHWA) and developed and managed by HSRC, HSIS currently uses data collected by eight states - California, Illinois, Maine, Michigan, Minnesota, North Carolina, Utah and Washington. Ohio will become part of HSIS this year. The multi-state data is collected, documented, and checked for quality by HSIS staff and is made available to other safety researchers, enhancing safety research practices across the United States.

Recent research efforts using HSIS data have involved the characteristics of intersections related to red-light running crashes, freeway work zone crash rates, and the identification of areas with high rates of pedestrian crashes.

Former HSRC Policy Board Member Becomes Head of National Highway Traffic Safety Administration

The UNC Highway Safety Research Center (HSRC) would like to congratulate Dr. Jeffrey Runge on his new position as the 12th administrator of the National Highway Traffic Safety Administration (NHTSA). Dr. Runge is a nationally recognized physician expert in motor vehicle injury care and prevention. The new NHTSA head is also a former member of HSRC's policy board.

Prior to taking his new position, Dr. Runge served on the faculty of the Emergency Medicine Residency at Carolinas Medical Center in Charlotte, N.C. A researcher and educator in emergency medicine, he has focused on the area of injury prevention and control, with a particular interest in motor vehicle injuries. This interest led him to be involved in several HSRC projects and programs.

In 2000, Dr. Runge served on HSRC's Policy Board. The 16-member board meets annually to provide general guidance to the Center. Dr. Runge had been a long-time research collaborator with HSRC, and his experience in one of North Carolina's busiest trauma centers

Dr. Jeffrey Runge

and his passion for reducing motor vehicle injuries was a tremendous asset to the Center, according to HSRC Director Dr. Doug Robertson.

"We are proud to have a former HSRC Policy Board member in such a prominent role and applaud his accomplishment," said Robertson. "There is no doubt in our minds that he will make a difference in making our nation's roads safer. We wish him the very best."

Little Steps Can Lead to Big Changes

INTERNATIONAL WALK TO SCHOOL DAY HAS NEARLY 3 MILLION PEOPLE WALKING AND TALKING ABOUT IMPORTANT COMMUNITY ISSUES.

On October 2 of last year, children, parents, teachers and community leaders in 49 states joined nearly 3 million walkers around the world to celebrate International Walk to School Day. The event has inspired many communities across the globe to make their streets more pedestrian friendly and get their residents more active.

For three years, Oakland, Calif., has made Walk to School Day a widespread effort with as many as 54 area schools participating. Information compiled from walkability checklists throughout the school district have led to much-needed improvements, such as sidewalk repairs and the employment of school crossing guards.

In Bradford, Great Britain, 31,000 walkers across the district took part in 2001 International Walk to School Day. The event focused on health, fitness, being more alert and improving the environment.

Students at Robert Coleman Elementary School in Baltimore participate in Walk to School Day 2001.

Children from the School "Dante" in Monza, Italy, celebrate 2001 International Walk to School Day. On the banner they wrote: "We think with our head, but we travel on foot."

"The event is more than just getting together with children and going for a walk to school one day a year," said Lauren Marchetti, associate director of the Pedestrian and Bicycle Information Center. "The event's greater aim is to bring forth permanent change in communities across the globe."

Here are a few of the event's goals:

- Encourage physical fitness through the easiest-to-do and most enjoyable form of exercise
- Promote safety by teaching children the skills to walk safely and to identify safe routes to school
- Raise awareness of how walkable a community is and where improvements can be made
- Raise concern for the environment
- Reduce crime and take back neighborhoods for people on foot

How do the children feel about International Walk to School Day? Here is what a student at Dante Elementary School in Monza, Italy, had to say:

"I liked this experience very much because, joining this event, we reminded people of respect for nature, we reduced air pollution, our families saved money, and, most of all, there was less stress and more happiness."

International Walk to School Day in the United States is sponsored by the Partnership for a Walkable America (PWA). The Pedestrian and Bicycle Information Center, a founding member of the PWA and a center within the UNC Highway Safety Research Center, maintains both the international and U.S. Walk to School Day web sites, as well as online registration for the annual event.

MARK YOUR CALENDARS!

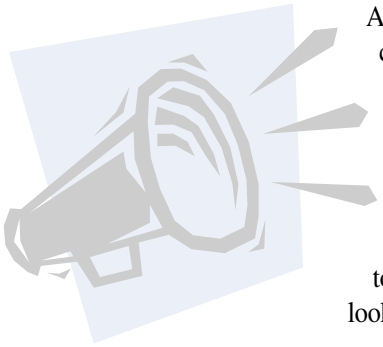
International Walk to School Day set for October 2, 2002.

To find out more about Walk to School Day in the United States or to register to participate in the 2002 event, go to www.walktoschool.org. If you want information on International Walk to School Day, go to www.iwalktoschool.org.

We Want to Hear From You!

We want to know what you think about "Directions" so we have set up an email address that you can use to share your thoughts and opinions on our newsletter. The email address is: directions@unc.edu

Tell us what you like about our newsletter. What do you think we could do better? Is there any topic you would like to see us include in upcoming issues? What stories have we printed that you particularly enjoyed?



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If you know of someone who would like to be added to our mailing list, please have them contact us. We look forward to hearing from you.

PRIVATE CONTRIBUTIONS WELCOMED

The UNC Highway Safety Research Center depends on grants and private donations to further its research and public service outreach. Some of our current projects are spotlighted in this edition of Directions. To find out about other areas of research at the Center and ways you can become a contributor, please contact Center Director Dr. Doug Robertson via phone at (919) 962-8703 or email him at doug_robertson@unc.edu. He can also be reached by FAX at (919) 962-8710 or by mail at 730 Airport Road, Suite 300, Campus Box 3430, Chapel Hill, N.C. 27599-3430.

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