



## **2008 ANNUAL REPORT**



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# Message From The Director

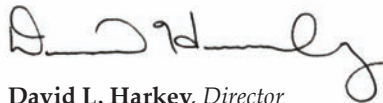
**October 2008**

As we reflect on this past year, we're proud to think back on our traditions and accomplishments of finding ways to reduce fatalities on our roads. One of the highlights we recognized in 2008 was the 25th anniversary of child passenger safety in North Carolina. HSRC was proud to lead research efforts in the late 70s and early 80s that helped encourage our state policymakers to recognize the importance of this issue and make motor-vehicle travel safer for children. Along with various partners, HSRC continues its work in child injury prevention by helping coordinate training and outreach for child passenger safety.

Traditions and long-term successes in this field are the result of individuals who dedicate their careers to improving safety on our roads. This year, we recognized the service of two HSRC staff. Dr. Jane Stutts, Associate Director for Social and Behavioral Research, retired after more than 30 years of leading behavioral research studies on a vast array of topics, including older drivers and distracted driving. Mr. Bill Hall, Manager of the Occupant Protection Program, was recognized for his career-long efforts related to child passenger safety. He was presented with the first annual Bill Hall Lifetime Achievement Award, sponsored by the NC Governor's Highway Safety Program and the NC Department of Insurance. Congratulations to Jane and Bill on their careers and accomplishments.

The Center also spearheaded some significant milestones in highway safety this year, including the first-ever evaluation of a state law banning cell phone use among teenage drivers, the completion of an international research exchange that was the first of its kind for HSRC, and the conclusion of a nearly decade-long study on pedestrian safety in large, urban environments.

In the coming year, HSRC researchers will focus their efforts in areas where we continue to need improvement. New projects are underway to better understand speeding behaviors and safety, address the needs of older road users, improve pedestrian and bicyclist safety, and enhance training for young drivers. We look forward to the year ahead and leading the way for new and innovative research to achieve our most important goal: safety for all road users alike.



**David L. Harkey**, *Director*

# Overview

## Our Mission

The mission of the Highway Safety Research Center (HSRC) at the University of North Carolina is to conduct interdisciplinary research and develop programs aimed at reducing deaths, injuries, and related societal costs of roadway crashes in North Carolina and the nation.

For over 40 years, HSRC has been a leading research institute that has helped shape the field of transportation safety.

## Year in Review

This year, HSRC focused on expanding various areas of study. By growing the HSRC staff and further tapping into the multitude of disciplines represented at HSRC, the Center was able to secure projects that will pave the way for safety innovation. HSRC was able to translate highway safety research into practical products for practitioners, including several new training courses, tools, and guides.

HSRC was awarded with the 2007 Founders' Award from the North Carolina Transportation Hall of Fame (NCTHF). The NCTHF was founded in 2003 to recognize and promote past, present, and future transportation accomplishments in North Carolina by honoring individuals, agencies, organizations, and businesses. The award was established a year later by founders Robert Martin and David Robinson to honor excellence in transportation among any mode or field.

HSRC continued to provide expert research and insight on projects with the U.S. Department of Transportation, the North Carolina Department of Transportation and other government agencies, foundations, and private organizations. HSRC staff members continued their presence on state and national safety committees, and served as key sources of safety information to transportation professionals, the general public, State legislatures, and the media.



Robert Martin presents HSRC Director David Harkey with the 2007 NCTHF Founders' Award.



# Center Highlights

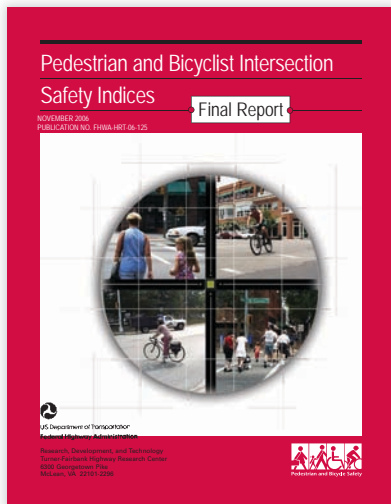
HSRC is consistently working on issues that affect all road users from motorists to pedestrians. Research is ongoing to ensure the most current information is available to the public. The following outlines a few of the highlights that came from HSRC in the past year.

# TRAFFIC OPERATIONS AND ROADWAY DESIGN

## Pedestrian and Bicycle Intersection Safety Indices

HSRC completed the development of the Pedestrian and Bicyclist Intersection Safety Indices (ISI), a tool for transportation engineers to identify intersections that should be the greatest priority for more in-depth safety assessment and possible safety improvement. Using observable characteristics, such as number of travel lanes, type of traffic control device, presence of bike lanes, and traffic volume, the tool provides a safety rating to assist engineers in deciding to what level the intersection should be prioritized for further investigation into its effect on pedestrian and bicyclist safety.

Researchers developed the Ped ISI and Bike ISI tools based on both safety ratings and observed behaviors. The ratings were derived from opinions of the safety of each site according to pedestrian and bicycle professionals and other experienced users. Behavioral data were also acquired through observations of interactions between pedestrians or bicyclists and motorists. These two sets of measures were combined to determine the relative safety of a crossing location for pedestrians or an approach leg for bicyclists and enabled the researchers to develop the safety indices for practitioners. A User Guide was also developed to assist safety professionals in using this new analysis tool. The study was funded by the Federal Highway Administration.



## Accessible Pedestrian Signals

An Accessible Pedestrian Signal (APS) is a device that communicates information about pedestrian crossings in a non-visual format, such as audible tones, verbal messages, and/or vibrating surfaces. Over the past several years, researchers at HSRC led a major project for the National Cooperative Highway Research Program to determine the APS features that offered the greatest safety benefit to visually impaired pedestrians. The research culminated in the development of *Accessible Pedestrian Signals: A Guide to Best Practices*, which provides training information for engineers, orientation and mobility specialists, and signal technicians on when, where, and how to install APS. The guidelines explain how APS devices provide optimal information through audible and tactile feedback and how the devices should be configured to deliver accurate information to visually impaired pedestrians.

The Guide is designed to serve as a companion resource document to a one-day training course on accessible pedestrian signals that HSRC researchers will teach across the country. The training course is intended to facilitate application of the guidelines and installation





and operation of APS. This training is oriented toward a tri-fold audience of traffic engineers, signal technicians, and orientation and mobility specialists.

### **Developing accident modification factors to reduce crashes**

In early 2008, HSRC researchers completed a project sponsored by the National Cooperative Highway Research Program to develop reliable accident modification factors (AMFs) for traffic engineering and ITS improvements. AMFs provide engineers with an estimate of the impact of safety improvements. They are often used by state and local transportation agencies to determine the level of safety improvement offered by specific treatments and/or to determine the costs and benefits of alternative treatments. Having reliable and accurate AMFs allows for the selection of improvements that will result in the “biggest bang for the buck,” which is critical with ever-shrinking budgets available to address road safety issues.

The final report includes a knowledge matrix showing the quality of existing AMFs and priorities for further research as well as the results of several AMF development efforts undertaken as part of this project. For each AMF qualified as credible, a table is provided with information that will assist engineers with the appropriate application of the safety estimate.

### **Evaluations of low-cost safety improvements pooled funds study**

Safety practitioners are continually voicing the need for safety effectiveness data. To address this need, the Federal Highway Administration sponsored the low-cost safety improvements pooled fund study using funds provided by individual states. The strategies to be evaluated in this study are low cost treatments identified as safety strategies in the National Cooperative Highway Research Program (NCHRP) Report 500 Guides. The overall goal of the study is to provide a crash reduction factor and benefit/cost economic analysis for each of the targeted safety strategies, and to learn and improve the process to assist in the field implementation of these safety strategies.

In Phase 1 of the study, HSRC researchers evaluated the safety impact of installing flashing beacons at stop-controlled intersections. The approach utilized the empirical Bayes method that compared the frequency, type, and severity of crashes before and after implementation of the treatment. The evaluation used data from North and South Carolina and showed that flashing beacons can be effective in reducing angle crashes at rural stop controlled intersections.

In Phase 2 of the study that is currently ongoing, HSRC researchers are examining the safety effect of improving delineation on horizontal curves. Data from Connecticut and Washington are being used for this evaluation.



# YOUNG DRIVERS



## **Participating in research and national policy development**

The Center for the Study of Young Drivers (CSYD) was established in 2006 and is housed within HSRC. CSYD's focus is to study and improve the safety of young drivers through developing a fundamental understanding of the multitude of factors that contribute to the high crash rate among young drivers.

At the urging of CSYD, and with CSYD input, the Transportation Research Board created a new subcommittee, chaired by CSYD Director Rob Foss, to address young driver issues. This subcommittee, which includes leading researchers in the field, organized a 2-day workshop, held in August 2008, to develop a young driver research agenda for the next several years. This agenda, to be published in 2009, is meant to guide both the decisions that funding agencies make and, more generally, the public discussion about young driver issues, both drawing attention to important matters and diverting it away from a variety of misconceptions about young drivers.

## **Evaluation of a teen driver cell phone restriction**

CSYD concluded the first ever evaluation study of a teen driver cell phone law, using North Carolina and South Carolina as the study sites.

Results of the study, funded by the Insurance Institute for Highway Safety, found that teenage drivers' cell phone use remained unchanged in North Carolina several months after the state enacted a cell phone restriction for young drivers. This occurred even though young drivers and their parents reported that they support the restrictions. Parents and teens alike believe the ban on hand-held and hands-free phone use isn't being enforced, and researchers concluded that North Carolina's law isn't reducing teen drivers' cell phone use in the short term.

The two-part study coupled researchers' observations of teenage drivers with telephone surveys of teens and their parents. This study will be published in *Accident Analysis & Prevention* in 2009. A follow-up study to examine longer term effects of the law is currently under way, with funding support from the National Highway Traffic Safety Administration.



### **Understanding how teens learn to drive**

HSRC is currently conducting a first-of-its-kind study to investigate the experiences of parents and teenagers during the learner stage of graduated driver licensing (GDL) – the period when teens are driving with parental supervision. Little is known about how teens first learn to drive or what parents try to accomplish as supervisors. To develop a better understanding of this process, researchers are conducting frequent telephone interviews with parents and also placing cameras in the vehicles of participating families so that parent and teen behaviors during practice sessions can be directly observed. This study is funded by the AAA Foundation for Traffic Safety.

A secondary goal of the study is to develop recommendations for how parents can most effectively supervise teenage drivers to produce safer driving. Recently, HSRC received additional funding from the AAA Foundation to continue interviews and in-vehicle camera surveillance during the first six months of teens' unsupervised driving. This is one of only two studies in the world to obtain 'naturalistic driving' data on beginning teen drivers. It promises to help provide answers to a number of heretofore unanswered questions about what teens learn and why their crash rates decline sharply as a function of driving experience.



# PEDESTRIAN AND BICYCLE SAFETY

## Researchers conclude nearly decade-long study in Miami-Dade County

In October of 1998, the National Highway Traffic Safety Association and the Florida Department of Transportation sponsored a study aimed at reducing deaths and injuries to pedestrians in large, urban environments through the implementation of a comprehensive countermeasure program. Miami-Dade County, Florida, was chosen as the focal point of the study due to its large number of crashes, the diversity of its population, and the willingness of local officials to participate in the study and elevate pedestrian safety to a higher priority.

From October 1998 to September 2007, HSRC conducted research in four zones that were identified within the county as having abnormally high pedestrian crash experiences. A total of 16 different types of education, enforcement, and engineering treatments were selected and targeted to reduce pedestrian crashes specifically in the four zones, and also countywide.

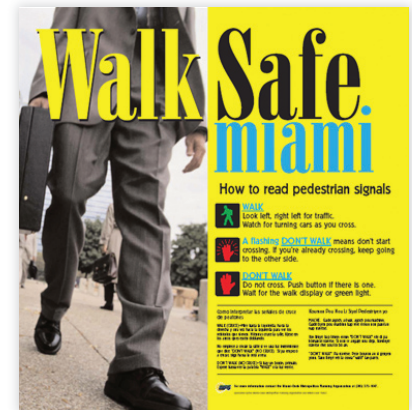
Evaluation of the comprehensive program on pedestrian crashes used a before-after time series analysis study with three separate control groups. Results showed that, at the peak of the program effects in 2003 and 2004, the pedestrian safety program reduced countywide pedestrian crash rates by between 8.5 percent and 13.3 percent, depending on which control group was used — that translates to approximately 180 fewer crashes annually in Miami-Dade County, or 360 pedestrian crashes reduced in 2003 and 2004 combined. The countermeasure program has been maintained by Miami-Dade officials, with a continuation of positive pedestrian crash results.

## Establishing a national Safe Routes to School research program

The National Center for Safe Routes to School (NCSRTS) launched a comprehensive national research program to determine the impact of Safe Routes to School (SRTS) programs. The research program will result in the collection of nationwide SRTS-related data and the identification of effective SRTS strategies.

Elements of the research program include:

- Standardized data collection forms to use to identify how students travel to school and parent attitudes that may influence whether children are allowed to walk or bicycle to school.



- National SRTS tracking database that includes the Safe Routes to School-related data being collected by programs. Using this information, the Center will be able to establish baseline information for evaluation of program elements.
- NCSRTS tracking reports to provide information about State SRTS programs. Each report presents a different snapshot and brief analysis of one key trend across all State programs.
- SRTS strategy evaluation to support responsible use of resources and implementation of initiatives that will improve walking and bicycling conditions or encourage use of existing facilities.
- Safety Index Development tool to assist with the identification and prioritization of infrastructure improvement needs along school routes.

### **Establishing the James L. Oberstar Safe Routes to School Award**

NCSRTS established and awarded the first annual James L. Oberstar Award. The award is named for Congressman James L. Oberstar (D-MN) to honor his dedication to America's school children as the pioneer for the National SRTS Program. Oberstar is the current chairman of the House Transportation and Infrastructure Committee and sponsored the Federal Safe Routes to School legislation that strives to create safe settings where more parents and children can walk and bicycle to school. The 2007 award honored the work of the Michigan Department of Transportation for their efficient and successful efforts in starting the Michigan SRTS program.

### **First Safe Routes to School National Conference**

NCSRTS and the Safe Routes to School National Partnership co-sponsored the first Safe Routes to School National Conference, November 5–7, in Dearborn, Michigan. Attended by a sell-out crowd of 400 people from around the U.S., the conference included Safe Routes to School local practitioners from a variety of disciplines including law enforcement, education, government, transportation, engineering, and others.

Hosted by the Michigan Fitness Foundation, the meeting presented an opportunity for those interested in the health and safety of children to explore aspects of the Safe Routes to School program and other elements that can improve the wellness of schoolchildren.



Congressman James L. Oberstar along with the 2007 James L. Oberstar Safe Routes to School Award winner, Michigan DOT Safe Routes To School Coordinator Mike Eberlein and others..

In addition to support for the conference, NCSRTS provided a total of \$20,000 in stipend funding to encourage attendance of local program champions who did not have other funding to support travel to the conference.

### **PBIC launches redesigned Web sites for walking and bicycling information**

The Pedestrian and Bicycle Information Center (PBIC) launched its redesigned pedestrian and bicycling Web sites, in its continued effort to disseminate information and technical assistance on pedestrian and bicycle safety.

The new features of the sites include:

- A centralized, Web-based Library of pedestrian and bicycling-related materials and documents compiled by practitioners and researchers.
- A searchable database of Frequently Asked Questions pertaining to bicycling, walking and safety. If users do not find their answer within the database, there is a mechanism for them to submit a question to the PBIC.
- A searchable database of upcoming pedestrian and bicycling events and training opportunities.
- A News Room with PBIC press releases, resources for the media, and recent news articles. Users can also sign up to received email updates and news from the Center.

The new site was developed with input from site users and PBIC stakeholders. Revised and new content on the site was developed in conjunction with pedestrian and bicycle safety experts from across the country.



# NEW INITIATIVES AND EXPANDING AREAS OF STUDY



## Development of a Speed-Related Crash Typology

While the nation has seen progress in major safety issues such as occupant restraint use and alcohol and driving, little if any progress has been seen with speeding. HSRC is in the process of completing a study funded by the Federal Highway Administration to help define those crash, vehicle, and driver characteristics that appear to result in a higher probability of a speed-related crash.

This study examined national data from the Fatal Accident Reporting System (FARS) and the General Estimates System (GES) along with data from North Carolina and Ohio to get a better understanding of the characteristics of speed-related crashes, including type of crash, where and when they occur, as well as who is most likely involved in these crashes. Key findings from this study include:

- A higher percentage of crashes at night (compared to day) involve speeding.
- Younger drivers (up to 25 year olds) are more likely to be involved in speeding related crashes compared to other age groups.
- Motorcycle operators are associated with a higher percentage of speeding-related crashes compared to car drivers.
- Drinking drivers are associated with a higher percentage of speeding related crashes compared to drivers not drinking.



## New training programs to improve pedestrian safety

The Pedestrian and Bicycle Information Center offers several training courses that provide technical assistance to professionals and community members in developing pedestrian safety action plans and in improving conditions for walking. The training instructors include staff from the PBIC as well as pedestrian and bicycle experts from around the country.

Several new training courses were developed and taught by the PBIC in 2008 and made available to provide technical assistance to professionals and community members in developing pedestrian safety action plans and in improving conditions for walking. Trainings range from one to three days in length and can be taught as a single course or a combination of courses. These trainings include:



- Developing a Pedestrian Safety Action Plan
- Designing for Pedestrian Safety
- Planning and Designing for Pedestrian Safety
- Creating Great Communities through Public Involvement
- Implementation of a Pedestrian Safety Action Plan

HSRC has also expanded its Web-based training offerings. NCSRTS developed a Web-based Skills for Local Safe Routes to School Program Development training that focuses on key steps to comprehensive SRTS planning, specifically addressing process issues critical to creating a solid framework on which to build a successful SRTS program. The Web-based version of this training allows the user to access and view the training modules at any time.

NCSRTS has also developed the Safe Routes Coaching Action Network Webinars in partnership with national pedestrian advocacy group America Walks. These free webinars are designed to educate individuals and organizations on topics that will assist with successful outreach efforts.

### **HSRC expands its international presence**

In March 2007, HSRC announced a research collaboration with Stichting Wetenschappelijk Onderzoek Verkeersveiligheid (SWOV), Institute for Road Safety Research, based in Leidschendam, Netherlands. As part of the agreement, HSRC researcher and PBIC Associate Director Laura Sandt spent six weeks at SWOV in spring 2008. While there, Ms. Sandt reviewed the SUNflower project, which includes an international benchmarking tool for evaluating road safety performance. She studied project methodology and outcomes and examined relevant U.S. projects related to roadway safety evaluation, data sources, and potential partners. This groundwork can potentially lead to future collaborative research to adapt and apply the SUNflower methodology in the U.S. During her stay, she also participated in several bicycle facilities tours and collected images and resources for the PBIC web sites.

In March 2008, Director David Harkey was a member of a Federal Highway Administration International Scan Team examining international best practices for accommodating older road users. The nine-member team visited Australia and Japan and met with professional colleagues in multiple locations to assess and evaluate infrastructure improvements designed to aid older drivers and pedestrians. Several strategies were developed from the knowledge acquired on this scan and believed to be the most critical for making progress in the U.S. These strategies, while aimed at older persons, will serve to improve safety for all road users.



HSRC researcher Laura Sandt spent six weeks in the Netherlands as part of a research collaboration with SWOV.

*From then...*



# Celebrating 25 years of Child Passenger Safety in North Carolina

On July 1, 2007 the state of North Carolina celebrated the 25th anniversary of the effective date of the original NC Child Passenger Safety (CPS) law. The initial law was named as “an act to require passenger restraint systems for children under two years of age being transported by the child’s parent who is operating his/her own family purpose vehicle.”

For over a quarter century, HSRC has played a key role in child passenger safety programs, activities, and research that has helped to keep kids in North Carolina and across the U.S. safe while in a motor vehicle. From research that shaped the first NC CPS law to grassroots initiatives aimed at the general public, HSRC has continued to work diligently in this area on behalf of the safety of children.

In the mid 1970s, less than 10 percent of drivers wore their seat belts and even fewer children — about 5 percent — were buckled up in any way in crashes. Recognizing the need for action, HSRC, under the direction of founding director B.J. Campbell and with funding from the North Carolina Governor’s Highway Safety Program, and in cooperation with the North Carolina Pediatric Society, conducted some of the first research studies in this area in the late 1970s. Led by a team including Center researchers Forrest Council, Bill Hall, Lauren Marchetti and Beverly Thomson, HSRC began to shape the way North Carolina, and the nation, thought about child passenger safety.

## Spreading the word

During the 1970s, the need for protecting child passengers in cars was not yet mainstream. A small number of reports had been produced indicating high numbers of child fatalities in motor vehicles, but little was known as to how to deal with the problem. Because the need for child passenger safety was little known at the time, Center staff had a wide audience to educate and equip with the proper tools to make Child Passenger Safety education a success. In 1978, as a first step educating a mass target market, HSRC researchers began meeting with key North Carolina pediatricians in



their offices and at annual conferences to provide them with educational materials to pass out to patients.

A major effort also went toward presentations to a variety of civic groups and public health professionals to provide them with the “why” and “how” of child passenger safety. These presentations included demonstrations of child safety restraints for infants and toddlers, and workshops on establishing car seat loaner programs. Funded by the NC Governor’s Highway Safety Program, HSRC provided written and demonstrated guidance on how to set up and run a loaner program, along with delivery of safety restraints to use for each program.

### **Becoming a movement**

As the awareness efforts in North Carolina began to see success, HSRC was awarded a contract from the National Highway Traffic Safety Administration to expand efforts and provide training workshops to similar groups across the nation. HSRC researchers traveled around the country to present informational workshops and make demonstrations, seeking to bring child passenger safety to the forefront of highway safety discussions. These efforts gained significant response and led to the formation and growth of the National Child Passenger Safety Association in 1981, for which HSRC researchers Forrest Council and Bill Hall have both served as President. The formation of the North Carolina Child Passenger Safety Association (later named the NC Passenger Safety Association) followed in 1982 and continued its advocacy and education efforts for another 20 years.

### **North Carolina legislators take note**

Recognizing the importance of the topic, Representative George Miller of Durham sponsored the first NC CPS law in 1979, which didn’t make it out of the House committee. Rep. Miller re-introduced the law in 1981 with support from a number of colleagues, as well as local and state healthcare and safety groups. The version of the law that passed at this time was much weaker and more limited than the version introduced by Rep. Miller. The only children covered under this first version of the law were those less than age two who were being transported by their parents in their family vehicle and allowed the use of a seat belt (as a substitute for a child restraint) at age one. To many, this first CPS law seemed to lack the provisions that would truly promote child passenger safety. But it was the opinion of Rep. Miller and others that the passing of some kind of law, albeit weaker than desired, was a step in the right direction for an increased interest in the topic.





The first CPS law went into effect in NC on July 1, 1982, with a “sunset” expiration date of June 30, 1985. This legislation made North Carolina the 8th state in the nation to pass such a law. Throughout the three-year period of legislation, interest in child passenger safety became more apparent. In accordance with the legislative mandate, HSRC evaluated the effects of the law and submitted an evaluation report to the legislature in 1985. Subsequent to the report, the 1985 General Assembly removed the “sunset” provision and reenacted and strengthened the NC CPS law to increase safety and protection for children while in a motor vehicle.



HSRC was also instrumental in providing information and testimony in support of passage of the initial NC Seat Belt law in 1985. The NC Seat Belt law required seat belt use for all drivers and front seat passengers who are not covered by the child passenger safety law.

### **Progressing forward**

Through continued research and evaluation outcomes, and passionate advocacy by proponents of strong child passenger safety and seat belt laws, the North Carolina law has evolved into what it is today. Now, children being transported by any driver in any vehicle equipped with seat belts are covered by the NC CPS law and children who are less than eight years old and less than 80 pounds must be in a car seat or booster seat and all occupants — including adults in the rear seat — must be buckled.



With the combined support of the NC Governor’s Highway Safety Program, as well as the involvement and support of the Department of Insurance and Office of State Fire Marshal, North Carolina now has CPS programs in 88 counties that provide education, “hands-on” car seat installation assistance, and low-cost car seats to parents in their communities. North Carolina also has over 2000 nationally certified CPS Technicians in place to support these programs.

HSRC is proud to continue its efforts to keep kids safe on our nation’s highways and congratulates North Carolina on 25 successful years of child passenger safety.

*...’til now*

## HSRC researcher recognized for lifetime achievement in Child Passenger Safety

Bill Hall, manager of the UNC Highway Safety Research Center's Occupant Protection Program, was recently recognized for his important role in child passenger safety as he was presented with the first annual Bill Hall Lifetime Achievement Award, sponsored by the Governor's Highway Safety Program and the NC Dept of Insurance — OSFM, in conjunction with the NC Child Passenger Safety Training Committee.

A researcher at HSRC for over 30 years, Hall has been involved in child passenger safety in NC from the beginning — before laws existed anywhere in the U.S. and before there was an organized effort to protect children from injury related to motor vehicle crashes.

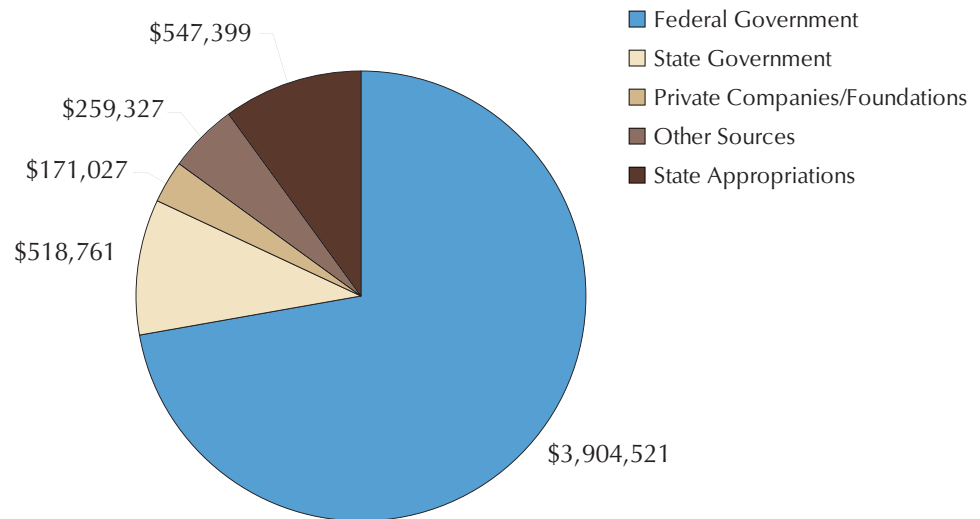
Hall became a key player in the research that would demonstrate the urgency for child passenger safety laws on both the State and Federal level. He played a major role in the 1981 legislation in North Carolina that required the use of child passenger restraints. Recognizing the need for programs and education, he worked closely with colleagues at HSRC and the Governor's Highway Safety Program in the late 1970s and early 80s to help organize the establishment of infant carrier loaner programs through local health departments and local civic groups. He helped to develop and conduct educational programs for a wide variety of groups to place emphasis on the importance of child passenger safety and the need for correct usage of child passenger restraints.



# Financial Report

The total revenues for the past fiscal year, FY08, were \$5.4 million. The majority (72%) of the revenues received were from contracts, grants, and cooperative agreements with Federal Government agencies. State government and private-sector contracts comprise an additional 13% of the revenues. For each dollar appropriated to the center by the State of NC, HSRC staff generated more than \$8 in research and program funding.

## Fiscal Year 2008 Revenues



# Current and Previous Funding Agencies

## U.S. and International Government Sponsors

U.S. Department of Transportation

- Federal Highway Administration
- National Highway Traffic Safety Administration

Transportation Research Board of the National Academies

U.S. Centers for Disease Control and Prevention

National Institutes of Health

- National Institute on Alcohol Abuse and Alcoholism
- National Institute of Child Health and Human Development

U.S. Environmental Protection Agency

University of North Carolina at Chapel Hill

North Carolina Department of Transportation

North Carolina Governors Highway Safety Program

North Carolina State Highway Patrol

Florida Department of Transportation

Kansas Bureau of Traffic Safety

Kansas Turnpike Authority

Land Transport New Zealand/The Beca Group

Traffic Injury Research Foundation of Canada

British Columbia Ministry of Transportation

## Foundation and Corporate Sponsors

Robert Wood Johnson Foundation

AAA Foundation for Traffic Safety

Insurance Institute for Highway Safety

General Motors

AAA Kansas

Motorcycle Safety Foundation

Society for the Advancement of Violence and Injury Research

State Farm Insurance Company

# Making It Happen: the people of HSRC

The people of HSRC are truly the foundation of the Center. Only through their creativity, passion, energy and expertise has the Center been able to achieve the success that it has.

## **Business Services**

Dianne Blake  
*Senior Accounting Specialist*

Patrick Fogarty  
*Technical Support Analyst*

Daniel Harper  
*Contract Specialist*

Harvey Hou  
*Computer Systems Manager*

Peggy James  
*Human Resources Manager*

Jean Justice  
*Office Assistant*

Paulette McKoy  
*Senior Contracts Specialist*

Jeana Nickerson  
*Business Officer*

Beverly Thomson  
*Senior Administrative Advisor*

## **Research Programs**

Jongdae Baek, Ph.D.  
*Post-Doctoral Research Engineer*

Jennifer Bonchak  
*Public Relations Coordinator*

Austin Brown, M.P.H., M.R.P.  
*Program Specialist*

Daniel Carter, M.S.C.E.  
*Engineering Research Associate*

Forest Council, Ph.D.  
*Senior Research Scientist*

Michael Daul  
*Graphic Designer*

Rob Foss, Ph.D.  
*Senior Research Scientist and  
Director, Center for the Study of  
Young Drivers*

Dan Gelinne  
*Research Assistant*

Zoe Gillenwater  
*Design Services Manager*

Arthur Goodwin, M.A.  
*Senior Research Associate*

Bill Hall, M.A.  
*Manager, Occupant  
Protection Program*

Charles Hamlett  
*Research Assistant*

David Harkey, M.S.C.E.  
*Director*

Bill Hunter, M.C.E.  
*Senior Research Scientist*

Katy Jones  
*Manager, Research Information  
and Education Programs*

Rich Lytle  
*Web Applications Programmer*

Lauren Marchetti  
*Director, National Center for  
Safe Routes to School*

Carol Martell  
*Senior Applications Specialist*

Natalie O'Brien, M.S.  
*Research Associate*

Nancy Pullen-Seufert, M.P.H.  
*Program Manager*

Craig Raborn  
*PBIC Technical Manager*

Eric Rodgman, M.P.H.  
*Senior Database Analyst*

Laura Sandt, M.R.P.  
*Research Associate and PBIC  
Program Manager*

Margaret Scully, M.R.P.  
*Special Projects Manager*

Raghavan Srinivasan, Ph.D.  
*Senior Transportation Research  
Engineer*

Carl Sundstrom, M.S.C.E.  
*PBIC Program Specialist*

Donna Suttles  
*Research Assistant*

Libby Thomas, M.S.  
*Research Associate*

Mary Ellen Tucker, M.L.S.  
*Librarian*

Carolyn Williams  
*Programmer Analyst*

Charlie Zegeer, M.S.  
*Associate Director for  
Engineering and Planning*



## HSRC Honors the Career of Dr. Jane Stutts



After more than 30 years of accomplished dedication, Dr. Jane Stutts retired from the UNC Highway Safety Research Center in July 2007 — leaving behind a legacy of a devoted, knowledgeable researcher, and a role model for any working woman.

Dr. Stutts left the Center as Associate Director for Social and Behavioral Research, where she was responsible for coordinating HSRC's research and programmatic activities related to the driver performance aspects of transportation safety. In her tenure at the Center, Jane managed a variety of projects in a number of related areas to highway safety and authored over 100 articles and technical reports. Upon retirement, her primary focus was on older drivers and driver distraction.

Jane received her undergraduate degree from Wake Forest University, earned a master's degree from Georgia State University and began the pursuit of her PhD from UNC Chapel Hill while employed at HSRC. She holds a Ph.D. in Epidemiology.

Dr. Stutts led projects that have been funded by the National Highway Traffic Safety Administration, Federal Highway Administration, National Cooperative Highway Research Program, Centers for Disease Control and Prevention, General Motors Corporation, the AAA Foundation for Traffic Safety, and the North Carolina Governor's Highway Safety Program. She said her proudest efforts would be those related to older drivers on a state and national level, and her work with distracted driving.

In addition to her research career, Dr. Stutts has been an active participant in many Transportation Research Board activities, including six years as chair of the Committee on Bicycling, membership on the Committee on the Safety and Mobility of Older Persons, membership and chair of the safety section on the Group 3 Council, and participation on two National Research Council appointed committees — the Steering Committee for a Conference on Transportation in an Aging Society, and the TRB-IOM Committee on Physical Activity, Health, Transportation, and Land Use. She is also active in the Association for the Advancement of Automotive Medicine, and served on its Scientific Program Committee from 1998-2001.

HSRC is proud to congratulate Dr. Jane Stutts on a remarkable career.

## Working within the University

Being a part of a world-class university has brought opportunity for HSRC to coordinate a number of inter-institutional collaborations to further educate the University community on the Center's research.



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

## Research Fellows

The following University of North Carolina affiliated researchers work with the HSRC on projects in the area of transportation safety and motor vehicle injury prevention.

Mary Altpeter  
*UNC Institute on Aging, UNC-Chapel Hill*

Mike Bowling  
*Health Behavior/Health Education,  
UNC-Chapel Hill*

Carolyn Crump  
*Health Behavior/Health Education,  
UNC-Chapel Hill*

James Drennan  
*School of Government, UNC-Chapel Hill*

James Emery  
*Health Behavior/Health Education,  
UNC-Chapel Hill*

Kelly Evenson  
*Epidemiology, UNC-Chapel Hill*

Laura Linnan  
*Health Behavior/Health Education,  
UNC-Chapel Hill*

Lewis Margolis  
*Maternal & Child Health,  
UNC-Chapel Hill*

Steve Marshall  
*Epidemiology, UNC-Chapel Hill*

Daniel Rodriguez  
*City & Regional Planning,  
UNC-Chapel Hill*

Anna Waller  
*Emergency Medicine, UNC-Chapel Hill*

Dianne Ward  
*Nutrition, UNC-Chapel Hill*

Herb Garrison  
*Brody School of Medicine,  
East Carolina University*

Joseph Hummer  
*Civil Engineering, NC State University*

Nagui Roupail  
*Institute for Transportation Research &  
Education, NC State University*

John Stone  
*Civil Engineering, NC State University*

Jeff Tsai  
*Institute for Transportation Research &  
Education, NC State University*

Deborah Underwood  
*Transportation Institute,  
NC A&T State University*

Johnny Graham  
*Civil Engineering, UNC-Charlotte*

Edd Hauser  
*Center for Transportation Policy Studies,  
UNC-Charlotte*

Martin Kane  
*Civil Engineering, UNC-Charlotte*

## Advisory Board

The HSRC Advisory Board consists of the following group of distinguished professionals, and serves to assist in the identification of strategies and program direction for the UNC Highway Safety Research Center.

Dr. Herb Garrison – Chair  
*Director, Eastern Carolina Injury Prevention Program, Greenville*

Dr. Alice Ammerman  
*Director, Center for Health Promotion & Disease Prevention, UNC-Chapel Hill*

Colonel W. Fletcher Clay  
*Commander, North Carolina State Highway Patrol*

Dr. Jo Anne Earp  
*Professor, Health Behavior/Health Education, UNC-Chapel Hill*

Mr. J. Douglas Galyon  
*Chair, North Carolina Board of Transportation*

Dr. Edd Hauser, P.E.  
*Director, Transportation Policy Studies, UNC-Charlotte*

Dr. Richard F. Pain  
*Transportation Safety Coordinator, Transportation Research Board*

Dr. Nagui Roupail  
*Director, Institute for Transportation Research & Education, N.C. State University*

Dr. Carol W. Runyan  
*Director, Injury Prevention Research Center, UNC-Chapel Hill*

Mr. John F. Sullivan III  
*Division Administrator, Federal Highway Administration*

Dr. C. Michael Walton  
*Chairman, Department of Civil Engineering, University of Texas at Austin*

## Ex Officio Members

Dr. Tony Waldrop  
*Vice Chancellor for Research & Economic Development, UNC-Chapel Hill*

Mr. David Harkey, P.E.  
*Director, UNC Highway Safety Research Center*

# 2007–2008 Publications

This listing includes publications from fiscal year 2008 (July 1, 2007 to June 30, 2008)

## 2007

Carter, D.L., Hunter, W.W., Zegeer, C.V., Stewart, J.R., and Huang, H. (2007). Bicyclist Intersection Safety Index. *Transportation Research Record No. 2031, Pedestrians and Bicycles*. p. 18–24.

Council, F.M., Harkey, D. L., Carter, D.L., White, B. (2007). *Model minimum inventory of roadway elements—MMIRE*. McLean, VA: Federal Highway Administration.

Gibbs, M., Sandt, L., Rocchi, S., Wilson, E., Lipinski, M. (2007). *Pedestrian road safety audit guidelines and prompt lists*. Washington, DC: Federal Highway Administration. 138p

Goodwin, A., Foss, R.D., Sohn, J., and Mayhew, D. (2007). *A Guide for Reducing Collisions Involving Young Drivers. Guidance for Implementation of the AASHTO Strategic Highway Safety Plan*. NCHRP Report 500. (Volume 19). Washington, DC: Transportation Research Board.

Harkey, D.L., Carter, D., Barlow, J., Bentzen, B.L. (2007). *Accessible pedestrian signals: a guide to best practices*. National Cooperative Highway Research Program web-only document 117A. Washington, DC: Transportation Research Board.

Harkey, D.L., Carter, D., Barlow, J., Bentzen, B.L., Myers, L., Scott, A. (2007). *Guidelines for accessible pedestrian signals: final report*. National Cooperative Highway Research Program web-only document 117B. Washington, DC: Transportation Research Board.

Marchetti, L., Jones, K., Pullen-Seufert, N. (2007). Safe routes to school: roles and resources for transportation professionals. *ITE Journal*, Vol. 77 No. 9. pp 16–21.

Martell, C.A. (2007, November). *SAS XML Mapper to the rescue*. Paper presented at the 15th Annual Conference of the Southeast SAS Users Group, Hilton Head, SC.

Martin, S. L., Pullen-Seufert, N., Moeti, R. (2007). Safe routes to school: bringing together transportation and public health. *ITE Journal*, Vol. 77, No. 9. pp 38–41.

Patel, R.B. Council, F.M. and Griffith, M.S. (2007). Estimating safety benefits of shoulder rumble strips on two-lane rural highways in Minnesota. *Transportation Research Record 2019, Statistical Methods, Safety Data, Analysis and Evaluation 2007*. Washington, DC: Transportation Research Board.

Sandt, L. and Zegeer, C.V. (2007). Characteristics related to midblock pedestrian-vehicle crashes and potential treatments. *Transportation Research Record No. 1982, Pedestrians and Bicycles*. Washington, DC: Transportation Research Board.

Zegeer, C.V., D.L. Carter, W.W. Hunter, J.R. Stewart, H. Huang, A. Do, and L. Sandt. (2007). Index for assessing pedestrian safety at intersections. *Transportation Research Record 1982, Pedestrians and Bicycles*.

## 2008

Brown, A., Khattak, A., Rodriguez, A. (2008). Neighborhood types, travel and body mass: a study of new urbanist and suburban neighborhoods. *Urban Studies*. Vol. 45, No. 4. pp. 963–988.

Goodwin, A.H., Hall, W.L., Raborn, J.C., Thomas, L.J., Masten, S.V., and Tucker, M.E. (2008). *Countermeasures that work*. (3rd ed.) Washington, DC: National Highway Traffic Safety Administration.

Harkey, D.L., Council, F.M., Srinivasan, R., Lyon, C., Persaud, B., Eccles, K., Lefler, N., Gross F., Baek, J., Hauer, E., and Bonneson, J. (2008). *Accident modification factors for traffic engineering and ITS improvements, NCHRP Report 617*. Washington, DC: Transportation Research Board.

Hunter, W.W. and Hunter, R.H. (2008) *Walk Wise, Drive Smart: A senior pedestrian safety program in Hendersonville, NC*. Washington, DC: National Highway Traffic Safety Administration.

Hunter, W.W., Srinivasan, R., and Martell, C.A. (2008). *Evaluation of a green bikeLane weaving area in St. Petersburg, Florida*. Tallahassee, FL: Florida Department of Transportation.

Lyon, C., Persaud, B.N., Lefler, N.X., Carter, D. L., Eccles, K.A. (2008, January). *Safety evaluation of installing center two-way left-turn lanes on two-lane roads*. Paper presented at the 87th Annual Meeting of the Transportation Research Board, Washington, DC.

Martell, C.A. (2008, March). *SAS XML Mapper to the rescue*. Paper presented at the SAS Global Forum 2008, San Antonio, TX.

Martell, C.A. (2008, March). *ColdFusion and SAS: No pain meds required*. Paper presented at the SAS Global Forum 2008, San Antonio, TX

Martin, S. L., Moeti, R., Pullen-Seufert, N (2008). Implementing safe routes to school: application for the socioecological model and issues to consider. *Journal of Health Promotion Practice*. Vol. 9 No. 2.

Mitman, M.F., Ragland D.R., Zegeer, C.V. (2008, January). *Marked crosswalk dilemma: Uncovering some missing links in a 35-year debate*. Paper presented at the 87th Annual Meeting of the Transportation Research Board, Washington, DC.

Raborn, J. C., Torbic, D.J., Gilmore, D.K., Thomas, L.J., et al. (2008). *A guide for reducing collisions involving bicycles. guidance for implementation of the AASHTO strategic highway safety plan*. (Volume 18). Washington, DC: Transportation Research Board.

(2008). *Safety research on highway infrastructure and operations. improving priorities, coordination, and quality*. Special Report 292. Committee on Research Priorities and Coordination in Highway Infrastructure and Operations Safety. (Forrest M. Council, Chair). Washington, DC: Transportation Research Board.

Salvesen, D., Evenson, K., Rodriguez, D., and Brown, A. (2008). Policies to promote physical activity: a case study of Montgomery County, Maryland. *The Journal of Public Health Management and Practice*. Vol. 14, No. 3. pp. 280–288.

Sandt, L.S., Schneider, R.J., Nabors, D., Thomas, L., Mitchell, C., Eldridge, R. J. (2008). *A resident's guide for creating safe and walkable communities*. Report Number FHWA-SA-07-016. Washington, DC: Federal Highway Administration.

Srinivasan, R., Carter, D.L., Persaud, B.N., Eccles, K. A., Lyon, C. (2008, January). *Safety evaluation of flashing beacons at stop-controlled intersections*. Paper presented at the 87th Annual Meeting of the Transportation Research Board, Washington, DC.

Srinivasan, R., F.M. Council, C. Lyon, F. Gross, N.X. Lefler, and B. Persaud (2008, January). *Evaluation of the safety effectiveness of selected treatments at urban signalized intersections*. Paper presented at the 87th Annual Meeting of the Transportation Research Board, Washington, DC.

Srinivasan, R., Harkey, D.L., Tharpe, D., Sumner, R., Parker, M.R. (2008, January). *Development of a web-based expert system for setting speed limits in speed zones*. Paper presented at the 87th Annual Meeting of the Transportation Research Board, Washington, DC.

Thomas, L., R. Srinivasan, L.E. Decina, and L. Staplin (2008, January). *Safety effects of automated speed enforcement programs: a critical review of international literature*. Paper presented at the 87th Annual Meeting of the Transportation Research Board, Washington, DC.

Zegeer, C.V., L. Sandt, M. Scully, M. Ronkin, M. Cynecki, P.Lagerwey, H. Chaney, B. Schroeder, and E. Snyder (2008, May). *How to develop a pedestrian safety action plan: Updated report*. Report No. FHWA-SA-05-12. McLean, VA: Federal Highway Administration.

Zegeer, C.V., R. Blomberg, D. Henderson, S. Masten, L. Marchetti, M.M. Levy, L. Sandt, A. Brown, J. Stutts, and L. Thomas. (2008) Evaluation of Miami-Dade pedestrian safety demonstration project. *Transportation Research Record No. 2073*, Pedestrians. Washington, DC: Transportation Research Board.

**Please visit HSRC's Online Research Library to view full text articles and ordering information at [http://www.hsrb.unc.edu/research\\_library](http://www.hsrb.unc.edu/research_library).**

# Web Sites

HSRC maintains nearly 20 Web sites for various highway-safety related projects and tools. For a complete list of Center Web sites, please visit <http://www.hsrc.unc.edu/websites>. The majority of projects and information discussed within the HSRC Annual Report can be found within these Web sites.



## UNC Highway Safety Research Center

<http://www.hsrc.unc.edu>

Our Web site features safety information on a wide variety of topics, a library of published research from the Center, along with news updates, links and other information.



## Pedestrian and Bicycle Information Center

<http://www.walkinginfo.org>

<http://www.bicyclinginfo.org>

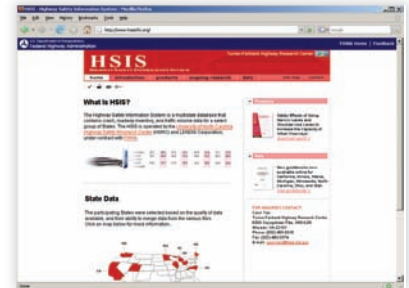
National clearinghouse of pedestrian and bicycle information about health and safety, engineering, advocacy, education, enforcement and access and mobility



## Highway Safety Information System

<http://www.hsisinfo.org>

Multi-state database that contains crash, roadway inventory and traffic volume data for a select group of states and urban centers



## National Center for Safe Routes to School

<http://www.saferoutesinfo.org>

Includes steps on starting a Safe Routes program, frequently asked questions, helpful links and a list of sample programs currently in place across the country



## Center for the Study of Young Drivers

<http://www.csyd.unc.edu>

Provides insight into why motor-vehicle crashes are the leading cause of death among teenagers and information on the research being conducted at the Center to investigate this issue





## NC Crash Data Query

<http://www.hsrc.unc.edu/crash>

A data analysis tool to create tables reflecting crash, vehicle and person information for crashes in North Carolina



## NC Child Passenger Safety Resource Center / National Child Passenger Safety Board

<http://www.buckleupnc.org>

Information about North Carolina occupant restraint laws as well as tips for choosing and using child occupant protection

<http://www.cpsboard.org>

Provides program direction and technical guidance to states, communities and organizations as a means to maintain a credible, standardized child passenger training and certification program



## U.S. Walk to School / International Walk to School

<http://www.walktoschool.org>

Information about Walk to School events in the USA, how to get involved and resources to help plan a walk in your community

<http://www.iwalktoschool.org>

Information about International Walk to School Month, recognized in October across the globe



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