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DIRECTIONS
winter 10

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CMF clearinghouse Homepage

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A CMF is an estimate of the change in crashes expected after implementation of a certain roadway safety treatment, such as a traffic signal. For example, imagine that an intersection is experiencing 100 angle crashes and 500 rear-end crashes per year. If you apply a countermeasure that has a CMF of 0.80 for angle crashes, then you can expect to see 80 angle crashes per year following the implementation of the countermeasure (100 x 0.80 = 80). If the same countermeasure also has a CMF of 1.10 for rear-end crashes, then you would also expect to also see 550 rear-end crashes per year following the countermeasure (500 x 1.10 = 550).

CMFs are often used by transportation professionals in their decision-making process to determine which countermeasures to implement in order to achieve specific safety gains. Previously, CMFs were located through various national and state sources. The CMF Clearinghouse gives transportation professionals' access to more than 1800 CMFs for over 400 countermeasures in one central, searchable location.

"Our goal is to provide practitioners with the information they need to make informed decisions for their road safety treatments," said Daniel Carter, engineering research associate at HSRC and member of the CMF Clearinghouse project team. "The CMF Clearinghouse brings together CMFs from references such as the *Highway Safety Manual* and the *FHWA Desktop Reference Guide*, as well as a multitude of recently published safety studies."

By searching the CMF database, professionals can identify potential countermeasures, obtain their expected effectiveness, compare alternative treatments and find resources on cost-benefit analysis. This enables users to make educated decisions about the most applicable CMF to their condition. In addition to the vast listing of CMFs, the Web site includes a general overview of CMFs, a glossary of terms related to CMFs and a listing of frequently asked questions. Users may access a comprehensive resources section that includes links to CMF-related information on trainings, resources and publications.

The CMF Clearinghouse also encourages transportation professionals to submit their own CMF studies for inclusion into the clearinghouse. The Web site will be updated regularly with new research and user submissions that have undergone critical reviews by the CMF Clearinghouse project team. Researchers at the HSRC have contributed significant work in the development, analysis and modification of specific CMFs. In 2003, HSRC researchers joined other highway safety experts as part of National Cooperative Highway Research Project (NCHRP) 17-25 to examine CMFs and their effectiveness. This effort resulted in the NCHRP Report 617: Accident Modification Factors for Traffic Engineering and ITS Improvements. The report was completed in 2008, and outlines 35 CMFs that are deemed to be of high or medium-high quality. For more information, please visit www.CMFClearinghouse.org.

Enhancing state Graduated Driver Licensing systems

In September 2008, the UNC Highway Safety Research Center (HSRC) was awarded a contract from the Centers for Disease Control and Prevention (CDC) to provide assistance to states that are interested in upgrading their Graduated Driver Licensing (GDL) systems. This new project involves working closely with state coalitions to bolster the quality of their young driver licensing systems in ways that are known to improve teen driver safety.

The process takes stakeholder groups through steps outlined in a GDL Planning Guide, developed by CDC with input from young driver researchers from HSRC and elsewhere. Assistance is being offered to a small number of states whose GDL systems have known shortcomings and where there is an existing group or coalition that has an interest in this issue.

As states work through the guide, HSRC researchers offer on-call assistance in tackling the individual issues of each partner state. These issues can include local data collection and analysis, designing surveys of parents, networking with additional state and national experts, and explaining GDL to legislators.

"GDL is different from most other traffic safety initiatives and, as such, is often misunderstood by the public, the media and policy-makers," said Rob Foss, senior research scientist and director of the HSRC Center for the Study of Young Drivers. "We can help with this by answering questions from representatives of the news media and by providing guidance on dealing with these kinds of issues locally."

As the HSRC team works with each state group, the researchers gather feedback that is used to assess the guide and the support process. The intent is to use this information to revise and update the *GDL Planning Guide*.

Making the curve safer

Example of a curve treated with enhanced delineations in Connecticut.

A recent UNC Highway Safety Research Center (HSRC) study finds that placing road warning signs to give motorists advanced notice of curves and marking the edges of the road as it turns can be a cost-effective approach to improving overall road safety. *Safety Evaluation of Improved Curve Delineation* provides analyses of these improvements to assess their safety and economic benefits. This work was led by HSRC Senior Researcher Raghavan Srinivasan. The co-authors included HSRC Research Associate Jongdae Baek, HSRC Engineering Research Associate Daniel Carter, and researchers from VHB, Inc. and Persaud and Lyon, Inc.

"These types of analyses are very important because they indicate which improvements are likely to reduce crashes and injuries," said Dr. Srinivasan. "They also provide the biggest bang for the buck by being cost-effective."

The report is part the Federal Highway Administration's (FHWA) Low Cost Safety Improvements Pooled Funds Study, an effort to evaluate unproven low cost strategies to improve safety and decrease fatalities in a variety of road conditions. The safety strategies are outlined in the *National Cooperative Highway Research Program (NCHRP) Report 500 Series*.

Addressing the safety of curves is an important step toward achieving the overall goal of the American Association of State Highway and Transportation Officials (AASHTO) Strategic Highway Safety Plan of reducing fatalities on U.S. roads. According to statistics from the Fatality Analysis Reporting System, approximately 27 percent of the 38,588 fatal crashes in 2006 occurred along curves, predominantly on two-lane rural highways. The average accident rate for curving sections of road is about three times the average accident rate for straight sections.

Utilizing data collected in Connecticut and Washington, researchers evaluated the safety implications of improvements such as reflective posts that mark the edge of the curve, known as "post-mounted delineators", chevrons with higher retro-reflectivity, and advanced curve warning signs. The results of the study indicate significant crash reductions following the addition of signs before and within the curve–an 18 percent reduction in crashes resulting in injuries or fatalities, a 27.5 percent reduction in crashes at night, and a 25.4 percent reduction for crashes at night caused by running off the road or crossing into another lane of travel.

An economic analysis revealed that the signing improvements are a very cost-effective treatment with the benefit-cost ratio exceeding eight to one. This estimate was made by comparing the annual cost of installing and maintaining these signs and the expected reduction in crashes based on information about the average cost per crash. The average costs of different crash types, for example running off the roadway, were provided by the 2005 FHWA study *Crash Cost Estimates by Maximum Police-Reported Injury Severity Within Selected Crash Geometries, co-authored by HSRC Senior Research Scientist* Forrest Council.

HSRC is currently examining other low cost improvements on horizontal curves, such as shoulder rumble strips and larger signs, for another study funded by FHWA. HSRC is also leading an effort funded by NCHRP to assess the effectiveness of improvements at signalized intersections.

The full report is available at http://www.fhwa.dot.gov/publications/research/safety/09045/index.cfm.

Educating the bicycle and pedestrian planners of tomorrow

Available course materials also include instructions for hosting a wheelchair lab.

University instructors who want to incorporate bicycle- and pedestrian-specific concepts into their graduate transportation planning programs can now access a full set of materials developed by the Pedestrian and Bicycle Information Center (PBIC), a national center housed within the UNC Highway Safety Research Center (HSRC). PBIC staff helped develop the 3-credit, graduate-level course with funding from the University of North Carolina at Chapel Hill.

"For students who want to work in a large, urban environment, experience working on pedestrian and bicycle issues is critical," said Laura Sandt, PBIC associate director and course co-developer. "This course covers key concepts on multimodal transportation planning that every emerging practitioner should know."

This graduate-level interdisciplinary course explores the core concepts related to creating and evaluating effective and comprehensive bicycle and pedestrian plans and programs. Following free registration, instructors interested in offering the course can access course assignments, grading keys, lab activities, and lecture materials, including slides with speaker notes. The modular course materials can also be integrated individually into existing courses to fit the needs of the students or the academic program.

The course was taught in 2009 within the UNC Department of City and Regional Planning. The course developers then revised course materials with student and instructor feedback.

For more information, please:

- Read the Executive Summary
- Get the Syllabus and list of course readings
- Register for the free, adaptable course materials

HSRC News Briefs

NCSRTS providing mini-grants to communities

The National Center for Safe Routes to School (NCSRTS) housed at HSRC is now in its second mini-grant award cycle to support creative, youth-focused ideas for safe walking and/or bicycling to school. Awarded programs receive up to $1,000 for local projects that encourage student creativity in Safe Routes to School (SRTS) activities.

"Communities across the country are finding new ways to make it safer for children to walk and bicycle to school," says Lauren Marchetti, director of NCSRTS. "These mini-grants encourage communities to get students involved in the effort to foster a culture of walking and bicycling in their own neighborhoods and schools."

NCSRTS is now accepting applications for up to 35 additional SRTS mini-grants. Applications are due April 7, 2010. More information about the mini-grant program and application process is available at http://www.saferoutesinfo.org/news_room/minigrants.

During the first cycle of mini-grants in spring 2010, the following 25 programs were selected:

- Thorne Bay School Student Council (Thorne Bay, Alaska)
- Town of Gilbert (Gilbert, Ariz.)
- Meiners Oaks Elementary (Ojai, Calif.)
- Dallas Ranch Middle School (Antioch, Calif.)
- Cesar E. Chavez Elementary School (San Pablo, Calif.)
- Bridge Street Elementary (Yuba City, Calif.)
- Get Smart Schools, Inc., (Denver, Colo.)
- Wood River Middle School (Hailey, Idaho)
- Keith Middle School (New Bedford, Mass.)
- Erickson Elementary School (Ypsilanti, Mich.)
- Lyndale Community School (Minneapolis, Minn.)
- Fairview Elementary School (Columbia, Mo.)
- Smithton Middle School (Columbia, Mo.)
- Oxford School District (Oxford, Miss.)
- Pinehurst Elementary School (Pinehurst, N.C.)
- Safe Kids and Century, J. Nelson Kelly and Lewis & Clark Elementary Schools (Grand Forks, N.D.)
- Saddlebrook Elementary and Activate Omaha (Omaha, Neb.)
- Fountain Inn Elementary School (Fountain Inn, S.C.)
- Beardon Elementary School (Knoxville, Tenn.)
- Roger E Sides Elementary (Karnes City, Texas)
- Alpine Elementary School (Alpine, Utah)
- Frances C. Hammond Middle School (Alexandria, Va.)
- Madison, Roosevelt and Pioneer Elementary Schools (Olympia, Wash.)
- Orca K-8 (Seattle, Wash.)
- Cumberland Elementary School (Cumberland, Wis.)

For more information about specific activities and programs planned at the above locations, please read the comprehensive mini-grant announcement.

HSRC participates in annual TRB meeting

Researchers from HSRC were among the ten-thousand transportation professionals from around the world that gathered in Washington, D.C. in January 2010 for the 89th Annual Meeting of the Transportation Research Board (TRB). TRB is one of six major divisions of the National Research Council—a private, nonprofit institution that is the principal operating agency of the National Academies in providing services to the government, the public, and the scientific and engineering communities. The meeting is an important opportunity for a wide array of policy makers, administrators, practitioners and researchers to share research and ideas regarding all transportation modes.

Members of the HSRC staff were active in TRB committee meetings and events. HSRC was represented in the Occupant Protection Committee, Safe Mobility of Older Persons Committee, Safety Data, Analysis and Evaluation Committee, Operator Licensing and Regulation, Young Driver Subcommittee, Operational Effects of Geometrics Committee, Intersection Joint Subcommittee, Roadside Safety Design Committee, Statistical Methodology and Statistical Computer Software in Transportation Research, Vehicle User Characteristics Committee, the Pedestrian Committee and Bicycle Committee and related subcommittees, and the Task Force for the Development of a Highway Safety Manual. Staff of HSRC's Pedestrian and Bicycle Information Center took part in the Feet First Caucus, and presented a pre-conference workshop on "Improving University Pedestrian and Bicycle Transportation Education."

Lauren Marchetti, director of the National Center for Safe Routes to School at HSRC, joined representatives from the Federal Highway Administration, Volpe National Transportation Systems Center and the New York City Department of Transportation to lead a session entitled "Livability Initiatives: Building Upon Walking and Bicycling Successes." Ms. Marchetti showed how early Safe Routes to School successes are well aligned with the Initiative's goals.

Below is a complete list of HSRC research presented at the meeting.

Change in Amount of Bicycling Associated with Installation of Bike Lanes in St. Petersburg, Florida
William Hunter
Raghavan Srinivasan, Ph.D.
Carol Martell

Examination of Horizontal Curve Collision Characteristics and Corresponding Countermeasures
Charlie Zegeer, P.E.
Carl Sundstrom, E.I.

Parents and Supervised Teenage Driving Practice
Arthur Goodwin, M.A.

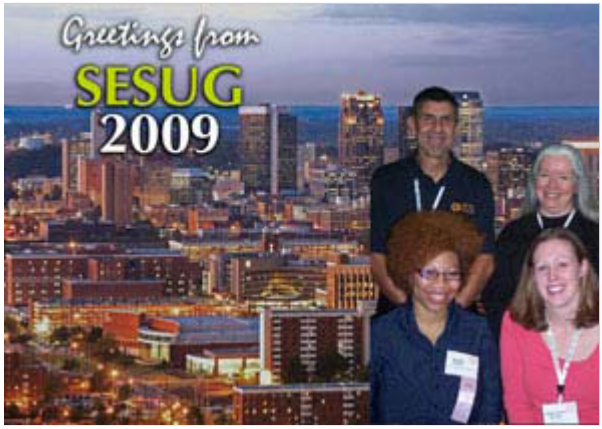
Pedestrian Safety Prediction Methodology for Urban Signalized Intersections
Raghavan Srinivasan, Ph.D.
Daniel Carter, P.E.
Charlie Zegeer, P.E.

Safety Evaluation of Improved Curve Delineation with Signing Enhancements
Raghavan Srinivasan, Ph.D.
Daniel Carter, P.E.
Jongdae Baek

Safety Evaluation of Transverse Rumble Strips on Approaches to Stop-Controlled Intersections in Rural Areas
Raghavan Srinivasan, Ph.D.
Jongdae Baek
Forrest Council, Ph.D.

A full compendium of papers and audio/visual content from the meeting is available from TRB at http://www.trb.org/AnnualMeeting2010/Public/AnnualMeeting2010.aspx.

HSRC, SAS®, and SESUG



SAS® software provides the backbone for data management and analysis for a large number of HSRC research projects. Carol Martell, senior applications specialist at HSRC, was conference co-chair for the 17th Annual Southeast SAS® Users Group (SESUG) educational conference, which was held in Birmingham, Ala., in October 2009. The conference offered concurrent sessions in six topic areas, pre- and post-conference intensive workshops, and SAS® Certification testing.

In addition to co-chairing the conference, Ms. Martell also presented on a method she developed using HSRC data for a paper entitled "Notes from an Intersection: Google Earth @ SAS®." Eric Rodgman, senior database analyst, and Carolyn Williams, analyst programmer, also took part in the meeting. Conference proceedings are available online at http://www.sesug.org/.

SESUG provided 15 student scholarships to attend the conference, among which were two recipients from UNC Chapel Hill – Keesha Benson, a doctoral student in the School of Social Work, and Annie Green Howard, a doctoral student in Biostatistics in the Gillings School of Global Public Health.

SESUG 2010 will be held in Savannah, Ga., September 26–28, 2010. Student scholarship applications are now open, and are due by

April 12, 2010. More information about the upcoming conference is available at http://sesug.org/SESUG2010.

HSRC e-Archives reaching back to the beginning

Since HSRC began publishing research reports in the late 1960s, the Center has maintained an archive of its research. These reports number close to 1,000 separate items, including final reports, interim reports and series. Many of these reports are interesting from a historical perspective, and they have content relevant to current research.

While much of the latest research reports produced by HSRC researchers are available online, many of the older reports still exist only in hardcopy. In order to improve access to the archive, HSRC Librarian Mary Ellen Tucker initiated a project to digitize selected reports published before the year 1990.

Thus far, over 100 full-text reports from 1967 to 1990 have been digitized. The digitization project began with a pilot test of one of HSRC's first reports, *Seat Belts: A Pilot Study of Their Use Under Normal Driving Conditions*, written by B. J. Campbell, Patricia F. Waller, and Forrest M. Council, and published in 1967.

Highlights of the HSRC archives that still carry significant resonance today include:

Review of Methods for Studying Pre-Crash Factors. Frank A. Haight, Hans C. Joksch, James O'Day, and Patricia F. Waller. Chapel Hill, NC: UNC Highway Safety Research Center, 1976

Accident Research Manual. Forrest M. Council, Donald W. Reinfurt, and B. J. Campbell. Chapel Hill, NC: UNC Highway Safety Research Center, 1980

Comprehensive Program for Increasing Use of Safety Seats and Seat Belts for Children and Young Adults. William L. Hall, Lauren M. Marchetti, Jeffrey Lowrance, Donna T. Suttles and Beverly T. Orr. Chapel Hill, NC: UNC Highway Safety Research Center, 1989

The HSRC Research Archive can be accessed at http://www.hsrc.unc.edu/research_library/index.cfm.

HSRC in the News

The following is a highlight of recent media stories that include information and research from the Center. Web links to the following news stories are time sensitive, so some stories might not be accessible after the initial publication date without required registration. To access more archived news media, please visit http://www.hsrc.unc.edu/news_room/archived_news.cfm.

Boulder transportation official: Cyclists should have to dismount at crosswalks
Boulder Daily Camera
March 16, 2010

Point Person: Our Q&A with Lauren Marchetti
Dallas Morning News
March 5, 2010

More teens waiting longer to get driver's license
Knoxville News Sentinel
March 2, 2010

Hush and drive ban debated in Chapel Hill
News & Observer
February 24, 2010

Poll finds support for cell-phone restrictions
News & Observer
February 22, 2010

Chapel Hill Town Council to host cell phone forum
Daily Tar Heel
February 12, 2010

In wake of child deaths on the First Coast, parents are stressing safety
Florida Times-Union
February 12, 2010

Fewer 16-year-olds getting driver's licenses
WRAL TV
January 25, 2010

Video: Is Facebook putting brakes on teen drivers?
WRAL TV
January 25, 2010

Two can't stop phoning while driving
News & Observer
January 24, 2010

More teens are choosing to wait to get driver's licenses
Washington Post
January 24, 2010

Texting ban difficult to enforce
Daily Tar Heel
January 19, 2010

Cell-phone use linked to wrecks
News & Observer
January 13, 2010

State is too slow in banning texting while driving
Boston Globe
January 12, 2010

Train victim was on her cell phone
News & Observer
December 31, 2009

Child deaths frustrate watchful drivers
News & Observer
December 29, 2009

Deadly week for teens: Five die in wrecks
WRAL TV
December 15, 2009

Driving to Distraction. Texting Now Banned
Phoenix14 News
December 08, 2009

The Scary New Truth About Women and Driving
Glamour Magazine
December 08, 2009

Keep thumbs on wheel, not your cell
News & Observer
December 01, 2009

New Laws: Texting While Driving Banned
Fox News Charlotte
November 30, 2009

New laws to target texting, reptiles
Greensboro News & Record
November 29, 2009