



Center for Excellence in Rural Safety

Mid-Term Report

July 2008





Center for Excellence in Rural Safety

Mid-Term Report

July 2008

Published by:
Center for Excellence in Rural Safety
Hubert H. Humphrey Institute of Public Affairs
University of Minnesota
301 19th Avenue South
Minneapolis, Minnesota 55455

UNIVERSITY OF MINNESOTA

CONTENTS

Rural Safety at a Glance.....	1
About the Center	1
Quick facts on rural safety.....	2

RESEARCH

End-to-End Emergency Response	3
Emergency excellence.....	4

SafeRoadMaps.org	5
------------------------	---

Safer Roads Through Policy	7
Promising policies.....	9

Safety Perspectives of Rural and Urban Drivers Across Different Generations	10
What makes rural crashes more deadly?	10

Other University of Minnesota Rural Safety Research.....	11
---	----

OUTREACH

Sharing Information About Rural Safety	13
Rural Highway Safety Clearinghouse	13

Center staff	14
--------------------	----

Dear Friends,

Stories of traffic deaths are so familiar we hardly notice them. A young man runs off a rural road on Saturday night; the car rolls, killing him. Passing on a two-lane highway, a pickup truck crashes into an on-coming car. Without his seat belt in place, one occupant flies through the front windshield and dies. An elderly driver is injured in a crash on a remote road. It takes the ambulance half an hour to get there and the man dies on the way to the hospital.

Traffic crashes take a huge toll in the United States. Each year, about 42,000 Americans die in crashes, more than die from breast cancer or AIDS, from Parkinson's disease or leukemia. More than half of these fatalities occur on rural roads (56 percent in 2006), though only 23 percent of the U.S. population lives in rural areas. Not surprisingly, many of the people killed on rural highways live in urban areas. Because traffic fatalities are so frequent and familiar, many drivers think they are unavoidable—accidents that cannot be prevented or predicted. Not true.

The Center for Excellence in Rural Safety is dedicated to finding ways to reduce traffic deaths in rural areas by increasing our understanding of the circumstances and behaviors that cause these deaths. Our research brings together experts from across the country to assess the varied causes of traffic deaths and the best ways to change those causes to reduce deaths. We are examining how new technology, better understanding of rural culture and driver behaviors, and public policies can act together to improve driver safety. We work in collaboration with federal, state, and local highway officials, safety organizations, private companies, and non-profit organizations to find the best information available. Our goal is to use that information to provide policymakers new tools for improving safety.

We also are committed to educating all drivers about safety. Through our Web site, www.ruralsafety.umn.edu, and public outreach and education, we hope to provide everyday drivers access to information on ways they can maximize safety and minimize fatalities. In addition, we are pleased to host the national Rural Highway Safety Clearinghouse, www.ruralhighwaysafety.org, for the U.S. Department of Transportation, an easy-to-use starting point for information about safety on our rural roads. This report is one step in our outreach program.

We hope you will find the summaries of our research and the data we have collected so far useful. Reducing rural fatalities requires collaboration on many levels. Please join us in our efforts to eliminate this unnecessary loss of life.

Sincerely,

Lee Munnich
Director, Center for Excellence in Rural Safety



Lee Munnich



Rural Safety at a Glance

The low-volume environment of rural roadways—with rows of crops or stands of trees on either side and seemingly miles of pavement between you and the next car—can give drivers a feeling of safety. Unfortunately, two-lane rural roadways are among the most deadly in the United States. For example, the fatality rate on rural roadways is more than twice that along urban roadways. In 2006, 23,339 people died in rural motor-vehicle crashes—56 percent of all motor-vehicle fatalities.

What contributes to rural fatalities? Crash data point to a number of factors. Some of these include: alcohol use, inexperience, driver behavior (such as speeding, distractions, or drowsiness), not using seat belts, and road conditions and design. In rural areas, the crash death rate also is compounded by factors such as the distance ambulances and police must travel to assist crash victims, who are five to seven times more likely to die if it takes more than 30 minutes to reach a trauma center after a crash. Addressing these issues and finding methods to improve safety through better use of technology and public policy is the mission of the Center for Excellence in Rural Safety.

What contributes to rural crashes?

Here are summaries of some of the contributing factors in rural crash fatalities:

Alcohol. Alcohol impairment was a factor in 32 percent of U.S. traffic fatalities in 2006, according to the National Highway Traffic Safety Administration (NHTSA). But 58 percent of the passenger-car fatalities involving alcohol-impairment during that year were in rural areas. Due to regional variations in attitudes toward drinking, the likelihood of an individual driving drunk varies greatly. A recent study by the National Study on Drug Use and Health, for example, found that the highest rates for drunk driving were in a tier of northern and largely rural states, including Wisconsin, North Dakota, Minnesota, Nebraska, and South Dakota.

Inexperience or Youth. Just as male teenagers and young adults are over-represented in alcohol-related crashes, young people overall die at relatively high rates in rural crashes. Though the mortality rate among young drivers has been decreasing, drivers 16 to 24 years old remain more likely to be in a crash and, according to a study done at the Johns Hopkins School of Public Health, a male teen driver is three times more likely to be involved in a fatal crash than drivers who are middle-aged. Among rural residents ages 4 to 34, vehicle crashes are the top cause of death. Teen drivers are more likely to engage in risky behavior, such as speeding, following too closely, and unsafe acceleration. Distraction in the form of other young people in the car as well as immaturity, inexperience, and feelings of invincibility also may contribute to vehicle crashes involving youth. According to NHTSA, 65 percent of teen passenger deaths occur when another teen is driving.

Driver Behavior. Whether they are speeding, talking on a cell phone, driving while drowsy, driving aggressively, or simply responding poorly to driving conditions, driver behaviors or decisions have been shown to be one of the factors in up to 90 percent of crashes. The consequences of these behaviors

About the Center for Excellence in Rural Safety

The Center for Excellence in Rural Safety (CERS) provides citizen-centered research, training, and outreach to enhance rural safety and to meet the online and seminar training needs of rural transportation practitioners and policymakers. The Center conducts several focused research activities to explore policy, behavior, and technology approaches, such as projects addressing safety-conscious planning, ITS and rural emergency response, integrated policy approaches, and related human factors, societal trends, and stakeholder needs analysis.

Congress created the Center for Excellence in Rural Safety in July 2005 as part of a broader, multiyear, multimillion-dollar directive establishing four national centers for surface transportation excellence in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) transportation funding legislation. The Center, sponsored by the Federal Highway Administration, is housed at the University of Minnesota's Hubert H. Humphrey Institute of Public Affairs.

Quick facts on rural safety

- U.S. population living in rural areas..... 23%
- Fatal crashes occurring in rural areas..... 55%
- Fatalities occurring in rural areas..... 56%
- Fatalities per 100 million vehicle-miles traveled in urban areas..... 0.93
- Fatalities per 100 million vehicle-miles traveled in rural areas..... 2.25
- Seat-belt use rate in urban areas..... 84%
- Seat-belt use rate in rural areas..... 78%

Source: National Highway Traffic Safety Administration

can be more deadly in rural areas, where high-speed travel along two-lane roadways is more typical. Drivers also may face unexpected obstacles along rural roadways, such as wildlife or farm animals, vehicles exiting or entering at unexpected intersections, sharper curves, or slow-moving farm vehicles. In Montana, for example, where 77 percent of the roads are considered rural, speed is a factor in 44 percent of crashes.

Seat Belts. In 2006, 57 percent of vehicle occupants that died in rural motor-vehicle crashes were unbelted. Rural motor vehicle occupants also are less likely (78 percent) to use their seat belt than those in urban areas (84 percent). In addition, seat-belt use among pickup drivers is lower than drivers of any other vehicle type. This resistance to seat belts may stem partially from rural cultural norms and the perception that it is safer to drive in rural areas, according to University of Minnesota research.

Road Conditions and Design. In rural areas, drivers typically have less room to recover from their errors. Many high-speed roads in rural areas are two lanes wide with a speed limit of 55 mph or greater. These roadways are among the deadliest in the United States. Shoulders widths are often minimal, which makes it more difficult for a driver to safely respond if they drift off the pavement. A 2004 study by the Georgia Institute of Technology, for example, attributed many fatal crashes in the southeastern United States to the abrupt drops at the pavement edge that can occur along rural roadways. In addition, poor or insufficient signage can also make local rural roadways more difficult to safely maneuver. Overall, 80 percent of the nation's 3 million miles of rural roads are maintained by local units of government. Addressing roadway design and maintenance issues related to safety will require collaboration.

End-to-End Emergency Response

Research seeks to integrate rural crash and trauma data to improve emergency care.

Moments that pass—and the information that is shared—from the time ambulances are summoned and victims are transported from a crash site to the hospital can mean the difference between one crash victim surviving and another dying.

Reducing the time it takes to respond to vehicle crashes and making the transitions between law enforcement, ambulance, and hospital smoother is the goal of Thomas Horan’s research into the use of intelligent transportation systems to promote rural safety. Crash victims are significantly less likely to survive if it takes more than 30 minutes from the time of the crash to arrival at the hospital, says Horan, research director for the Center for Excellence in Rural Safety (CERS). In rural areas, the average emergency response time is 52 minutes compared to 34 minutes in urban areas. This may partially explain why rural crashes are more likely to be fatal crashes, with 60 percent of all traffic fatalities occurring on rural roads nationwide though only about 20 percent of the population lives in rural areas.

“Because of the longer response times, there is an important need to understand how emergency response can be improved,” Horan says. “We need to understand the role information can play in improving the timeliness and the quality of emergency response in rural areas.”

Horan and research partner Benjamin Schooley have been examining rural emergency response and the ways information technology can be used to improve response for several years. “The challenge for information and computer science is to devise new approaches and systems that facilitate rapid use of accurate information for emergency response,” says Horan, who has previously used the real-life experiences of emergency medical providers to develop computer models for approaching time-critical situations. Their earlier research in rural areas of Minnesota and Virginia pointed to four issues that determine how well emergency response occurs. They include how and when information is passed from organization to organization in an emergency (time and information linkages), how well organizations are able to cooperate and share information, how emergency response works from end-to-end, and how well EMS operates in both normal and extreme conditions.

Their research with CERS extends that earlier model and focuses it on the issue of end-to-end response, says Horan, meaning from the moment a crash occurs until the victim is released from the hospital. Approaching emergency response step-by-step is more complicated than it may initially seem. To track a single patient from crash to recovery requires access to multiple data collection systems maintained by police, ambulance services, hospitals, and the patient’s primary-care physician. It also requires integration of these diverse data systems as well as the introduction of new technologies—or modifications of old ones—to allow emergency responders to pass critical information from one to the next in “near real time,” Horan says.

“What we’re trying to get to is an integrated trauma information system,



Emergency excellence

What would a high-performance emergency response architecture look like? Here are 12 characteristics identified by CERS researchers and their collaborators at the Mayo Clinic. The goal: Improvement in the timeliness and quality of response.

- Complete patient information
- No pre-hospital/hospital gap
- High system usability
- Optimal use of data/communications standards
- High end-to-end awareness
- Complete performance feedback for providers
- High degree of team interactions
- High stakeholder involvement
- Effective use of contracts among providers
- High non-contract information sharing
- Recognized policy opportunities
- Sufficient resources for providers

a real-time data network so people can get the information they need when they need it,” Horan says. Critical information could include everything from the G-force of the crash, which on-car computer systems, such as OnStar, might collect, to whether the occupant was thrown from the vehicle, to any pre-existing medical conditions the victim might have, such as high blood pressure, or a list of medications the victim may be taking.

In 2007, Horan and CERS established a partnership with the Mayo Clinic in Rochester, Minnesota, to develop a best-practices model for responding to emergencies in rural areas. The clinic, in addition to having a state-of-the-art emergency care and emergency communications department, owns the local ambulance provider as well as helicopter and air medical transport services. Representatives of every phase of an emergency response participated in focus groups with Horan and Schooley to determine where gaps in information existed and how information technologies might address those gaps. The researchers also were given access to information about crashes and medical response for the year 2006.

The data analysis and interviews led researchers to 12 findings related to how well emergency response occurs. But the area with the most potential for improvement was the hand-off between pre-hospital care providers—police officers on the scene, emergency medical technicians—and the hospital emergency room, Horan says. Research highlighted the importance of issues such as having available unified patient health records so emergency room doctors could be aware of critical aspects of a victim’s medical history such as drug allergies, understanding whether a medical situation such as a heart attack may have caused the crash, and the difficulties of sharing data—the right data—across responder systems both technically and practically.

“At each step of the process, people have different short lists of the information they need to have,” Horan says. “Dispatchers, for instance, need to know where the accident is. We’re trying to think about a dynamic system that everyone would be able to feed into, so that dispatch would be getting their short list taken care of but the attending physician in the hospital would be getting information that he or she needs, such as patient history and whether they were thrown from the car.”

“At the Mayo Clinic, we are interested in providing not only timely response, but the highest quality emergency care for our patients,” says Dr. Scott P. Zietlow, director of trauma care at Mayo. “Our research provides an important opportunity to take a comprehensive look at how pre-hospital care can be linked to health outcomes.”

Information from the Mayo study allowed CERS researchers to create a high-level architecture—or a best-practices model—for high performing emergency response systems. These systems would allow integrated information sharing across organizations and would establish performance standards for providers. The next step in the project is to expand the end-to-end data analysis to the state level. The creation of a statewide trauma network, most likely in Minnesota, would be a possible outcome of this work. In June 2008, CERS researchers presented the results of their work at a National Science Foundation forum, sponsored by COMCARE, a national network of emergency responders.

Says Horan, “What we’re working toward is the next generation of emergency response.”

SafeRoadMaps.org

A powerful new online crash-mapping tool helps create safer roads.

Every time a fatal crash occurs, police and transportation officials collect reams of data. What direction and speeds were the drivers going? How old were the drivers? Had they had anything to drink? How long had they been awake? Was it foggy, windy, or rainy? Was the roadway slick or in disrepair? Collected by local, state and sometimes federal officials, this information—along with data related to safety policies—presents a detailed picture of fatalities and the relative safety of the roads on which they occur. Until now, this information was stored in dozens of databases in a way that was “impenetrable to the average Joe,” says Thomas Horan, research director for the Center for Excellence in Rural Safety (CERS).

Now a new Web site sponsored by CERS makes this data accessible to all drivers with the click of a mouse. Horan, visiting scholar at the Humphrey Institute, worked with safety officials and a highly skilled group of computer programmers to develop the new Web site, www.saferoadmaps.org. The site is not just a collection of numbers, but a tool for policymakers. It “uses the power of visual technology to improve information about safety,” Horan says. “We always look for the weather map when getting a weather report. We’re very used to traffic maps that show us which roads are congested. So why not a safety map?”

The CERS site is the most comprehensive of several efforts to use technology to provide greater and more useful access to information about safety. In a more limited fashion, other Web sites also help drivers navigate the mass of information on roads, crashes, and driver behavior. For example, crash data on all vehicle collisions in five counties in southeastern Wisconsin are now available through the Community Maps Pilot Site, a project developed at the Wisconsin Traffic Operations and Safety Laboratory. The site allows users to locate, analyze, and avoid areas where crashes have occurred. Like the Wisconsin program, the CERS site uses mapping technologies similar to those used by Google maps. It also employs what is called a mash-up—a Web-based computer application that combines and filters data from a variety of sources. But, in keeping with the CERS role as a national center of excellence, the CERS interactive maps cover all 50 states.

The site includes data—which had already been collected and stored on dozens of government databases—about each of the more than 40,000 annual U.S. traffic fatalities. Using the site is as simple as filling out an online form. Users mark which geographic areas they would like to look at and what factors they would like to incorporate. For instance, if you check Maine and ask for all fatalities in the state, the site shows a map of Maine with dozens of marks for fatal crashes, most concentrated in the southeast corner of the state. If you restrict your search to only those crashes occurring on rural roads and involving alcohol, the number of crashes is significantly reduced, though the area with the highest concentration of crashes remains the same: the stretch of road between Lewiston and Augusta, Maine. Each fatality is marked with a yellow hazard triangle with an exclamation point in it. To find out more about a specific crash, users can click on a triangle to be connected to a news article or other public information.

Pulling together the information for the site and creating the programs to produce maps that are accurate and easy to understand was a months-long project, Horan says. He and fellow researchers Brian Hilton and Benjamin Schooley had consulted with officials from the U.S. Department of Transportation and the American Association of State Highway and Transportation Officials (AASHTO) about the need to create a “performance dashboard” for rural safety. Performance dashboards, a popular tool in business and government where managing large amounts of information is essential, provide a visual representation of the information essential to achieving an organization’s goal. In this case, the maps not only provide information about crashes for the public, they also give officials clues as to which public policies help reduce rural traffic deaths. Before going live with the Web site, Horan and other CERS researchers asked members of Congress and their staffs, federal transportation officials, and others involved in rural safety for their comments on the project. “The consensus has been that this is a tremendous tool to inform the general public about rural safety,” Horan says. “It really punches through the bureaucracy.”

Another benefit of the site is its ability to pull complex data together to assist policymakers. Often an individual’s perception of the relative safety of situations is skewed. For example, between 2002 and 2008, no one died in a crash of a major airliner in the United States, yet many people remain afraid to fly. Similarly, many people feel they are safer on rural roads than they are on urban streets because of the perception of wide-open spaces. Yet, the opposite is true. Saferoadmaps.org gives policymakers a concrete way to assess the danger of roads, in order to make more effective policies. The site also has great potential as an educational tool, Horan says. It allows users to see which states have policies known to improve safety, such as a primary seat-belt law or additional penalties for aggressive driving. Because it is visual, with each triangle representing at least one life lost, the maps have an emotional component to them that is unexpected and powerful.

“When you see it all at once, it makes it palpable what a public health challenge traffic fatalities are,” Horan says.



Safer Roads Through Policy

Research tells us who dies in rural crashes and why. Can public policy change that grim picture?

Statistics paint a clear portrait of fatal crashes and their victims.

Disproportionately, fatal crashes occur on rural highways, especially well-traveled two-lane roads. Many involve young, male drivers and happen during the weekend. Driver inattention causes many crashes, though 35 percent involve alcohol. Not wearing a seat belt increases the likelihood of deaths, with 50 percent of fatal crash victims unbuckled at the time of the crash.

“There is an awful lot of data to show the causes of fatalities,” says Lee Munnich, director of the Center for Excellence in Rural Safety (CERS) and a senior fellow and director of the Humphrey Institute’s State and Local Public Policy Program. “Using that data you can target efforts toward those things that have the greatest probability of reducing deaths.”

In the past, better engineering was the tool of choice for reducing traffic deaths, Munnich notes. Vehicle safety features such as seat belts, anti-lock braking systems, air bags, and rollover resistance technologies have made cars and trucks safer than ever before. As a result, the death rate per 100,000 million vehicle-miles driven in the United States has fallen from 4.8 in 1970 to 1.4 in 2006, according to federal highway data.

“We have designed cars so that even in a severe crash the likelihood of death is reduced,” Munnich says. And, drivers sense their increased safety—going faster, driving more aggressively, turning their attention away from the road with cell phone conversations or a cup of coffee in the car. “As cars have gotten safer, people have pushed the limits of the car,” Munnich says.

The next logical step for making improvements in safety may be more challenging—changing how drivers behave. As part of the CERS research program, Munnich has been examining the role public policies can play in improving safety, with a goal of developing a short list of policies most likely to change behaviors and to have an impact on traffic deaths. With fellow researchers Tyler Patterson and Alec More, Munnich has been examining public policies at both the state and local level to determine which are most likely to affect death rates. Initial research indicates that a cluster of policies involving greater use of intelligent transportation systems and targeted public education and enforcement efforts are most likely to lead to a decline in death rates.

State-level planning

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) required each state to develop a strategic highway safety plan. In reviewing plans from six states, Munnich and More found several common approaches and challenges identified by states, including reliance on technologies such as global positioning systems, identification of changes in driver behavior as a key aspect in reducing deaths, and the need for both political leadership and collaborative approaches across government agencies in safety planning.

The six plans evaluated were from a diverse set of states demographically,





geographically, and politically: Alabama, Idaho, Maryland, Minnesota, Vermont, and Washington. Each of the state plans highlights the need to change driver behavior to reduce deaths, but plans offer a variety of approaches to that issue. For instance, Washington's plan focuses on ways to reduce rates of impaired driving and speeding. Activities ranging from driving while tired to fiddling with in-car DVD systems can reduce drivers' response times in emergency situations.

In Washington, speeding was a factor in 62 percent of fatal accidents. To address this issue, highway and law enforcement officials recommend increased penalties for offenders and targeted law enforcement. In addition, Washington planners are emphasizing reaching specific populations, such as young drivers, through changes in licensing procedures and new driver education programs.

In Idaho, where seat-belt use has traditionally been relatively low, the plan calls for education programs to raise awareness of seat-belt use. (It must be working: seat-belt use has gone from 60 percent in 2001 to 78 percent in 2007, according to federal highway statistics.) Three of the six states have primary seat-belt laws, which allow police to pull a driver over simply for not wearing a seat belt. However, fines and how seriously drivers take them, vary. In Alabama, not wearing a seat belt will cost you only \$10 compared to \$110 in Washington.

Maryland's safety plan includes education but also suggests ways roads could be engineered to modify driver behaviors. One-third of Maryland's fatalities involve drivers running off the road. Solutions include soft shoulders, intelligent intersections, greater use of roundabouts, and pavement technologies that reduce speed, increase friction, and increase drivers' awareness of the edge of the road.

Despite the differences in approach, the state plans have several common elements. Many of those interviewed about the plans note the importance of legislative changes to increase fines and penalties or provide funding for enforcement technologies, education programs, or road improvements. The political challenges of passing new laws can be substantial. Moreover, the plans note the importance of collaboration among large, diverse agencies, such as highway, public safety, and public health agencies, many of which have competing priorities. Finally, drivers—and the lawmakers who represent them—often view driving as a basic freedom with which the state should not interfere too strongly.

"When people are in their cars, they have a feeling that they can behave any way they want," Munnich says. "But the fact is that they are on a public road and are interacting with other drivers."

Local action

While state-level policies structure most rural safety initiatives, regions and local areas may have specific safety challenges that can be addressed locally. Munnich and Humphrey Institute researcher Tyler Patterson examined fatal-crash characteristics in a five-county area north of Minneapolis/St. Paul as a case study.

The area studied is largely rural—the largest community has only 5,200 residents—but includes Interstate 35, the primary roadway between the

Twin Cities and Duluth and other vacation areas in northern Minnesota. One finding of the study was that approximately a third of the fatalities in this area occurred along interstate, U.S., and state highways. These types of roadways typically have higher traffic volumes.

A review of the crash data in the case study area also found a higher than expected number of fatalities among young males. Men ranging from 20 to 24 years old account for less than 3 percent of the population in the study area, but are involved in 12 percent of the fatal crashes. Alcohol is implicated in 35 percent of the fatal crashes in the region—about the state average for Minnesota—but in one of the study counties, alcohol is a factor in nearly half of the fatalities.

Understanding unique aspects of a local situation can lead to effective local solutions, Patterson and Munnich note. For instance, in the study area, a local judge has targeted drunk drivers. Judge James E. Dehn of Isanti County has tried several innovations in dealing with drunken drivers. For example, the judge began notifying bar and restaurant owners when their establishment was the last place to serve a drunk driver, asking the establishment to refuse to serve that person again.

Judge Dehn also offers an alternative sentencing program for DWI offenders, which staggers the jail time an offender must serve and combines it with electronic monitoring. Offenders who change their drinking behavior may be able to earn the option of having some of their sentence forgiven. The program has won at least one award and Judge Dehn says it “empowers the drunk driver to change his life.”

Policies like these can reduce the number of highway deaths, though it will require collaboration and some expense. But with 42,000 people dying each year in traffic crashes, Munnich notes, “you can analyze the ups and downs of it all you want, it’s still too many deaths.”

Promising policies

Public policy can help reduce traffic fatalities. Here are five proven or promising strategies from CERS researchers to reduce driving deaths.

- Primary seat-belt laws. Allowing police officers to issue a ticket solely for not wearing seat belts increases seat-belt use about 10 percent. More than 50 percent of rural fatal-crash victims are not buckled up.
- Targeted safety programs. Fatal crashes are over-represented in certain populations and certain areas disproportionately. Education programs should be directed at young drivers, especially males, and targeted where they are: on the Internet. Road enhancements will likely save more lives when focused on high-volume, two-lane roads in rural areas.
- Collaborative efforts. Highway engineering and law enforcement should not be the only public agencies involved in safety questions. Public health and education departments, as well as nonprofits devoted to safety, can be effective partners in promoting safety.
- Greater use of technology. Technology can provide cost-effective enhancements to safety and greater understanding of rural safety issues. Ignition-locking systems can help keep drunk drivers off the road. Global positioning technologies can be used to identify high-frequency crash locations or assist emergency responders.

Safety Perspectives of Rural and Urban Drivers Across Different Generations

What makes rural crashes more deadly?

Ten factors typify rural crashes compared to urban ones. These help explain the high rate of rural fatalities.

1. More likely to cause more than one death
2. Occur in daylight or on unlit road at night
3. Male driver
4. Young driver
5. Alcohol involved
6. Truck involved
7. Higher speed
8. Vehicle rolls over
9. Head-on collision
10. Passenger or driver ejected

Source: National Highway Traffic Safety Administration

Teens and seniors share views on safety and offer insights into ways to reach each generation.

Understanding the perceptions rural and urban drivers have about traffic safety and safety interventions prompted a team of University of Minnesota researchers to study geographically divergent driver perspectives on rural and urban safety. The research could help safety advocates determine how to target safety programs more effectively.

Michael Manser, director of the HumanFIRST Program at the University, is leading the research effort, funded by the Minnesota Department of Transportation (Mn/DOT) with additional support from the Center for Excellence in Rural Safety (CERS) and the Intelligent Transportations Systems (ITS) Institute. The research is being conducted at the HumanFIRST Program, which uses tools of psychology and human factors within the domain of transportation to understand driver behavior.

“Traffic safety is a significant issue in the United States,” Manser says, “and one of the challenges for those developing and implementing traffic safety programs is to target their efforts and resources. If we want to maximize the benefits of these programs, one approach is to focus on those groups that may benefit the most.”

Addressing this issue required HumanFIRST Program researchers to design a study conducted in both rural (City of Mora, Kanabec County) and urban (City of Minneapolis, Hennepin County) areas. Due to their potential to benefit from focused traffic safety programs, both teen and senior drivers were included in the study within each geographic location. To maximize effectiveness, the study was composed of two parts. The first part consisted of multiple traffic-safety surveys and questionnaires that explored driver perceptions of their own driving habits and skills, and of others within their age cohort. In addition, this part explored drivers’ perceptions about their own safety on the road and what risk factors they felt contributed to unsafe driving within their geographic region.

The second part consisted of focus-group discussions in which drivers were asked to identify interventions they felt would increase traffic safety within their age cohort. The focus-group discussions also gained feedback from drivers within each age cohort about the utility of specific traffic-safety interventions. Teen drivers were asked about nighttime and passenger graduated driver-licensing provisions and a teen-driver-support system that addresses several traffic-safety factors within this age group. Senior drivers provided feedback relative to a region-wide mobility program and driver testing.

Previous HumanFIRST studies provide preliminary evidence indicating differences in traffic-safety perceptions between rural and urban cultures and between teen and senior drivers. Results of the current work are expected to build on these findings by addressing traffic-safety programs that may be implemented to best serve drivers of different age groups in geographically divergent areas. Results should be available in fall 2008.

Other University of Minnesota Rural Safety Research

In addition to funding the previously described research, the Center for Excellence in Rural Safety disseminates information about a variety of research efforts at the University of Minnesota intended to increase knowledge about transportation safety in rural areas.

Deer-Vehicle Crash Information and Research Center (DVCIR Center). This pooled-fund project is funded by a consortium of nine states and the Federal Highway Administration. It is the only research center in the United States focused solely on the safety impacts of deer-vehicle crashes (DVCs). In cooperation with the Texas Transportation Institute, the DVCIR Center provides a clearinghouse of information and research related to DVCs, one of the most common crashes in rural areas. The center collects and shares data and information about DVCs and their potential countermeasures. It also has started to define and fund research on applications that could help better define the DVC problem and its relationship with the roadway environment. DVCIR Center staff have published various papers related to DVC countermeasures, sign placement and other mitigation. They have presented work on the subject throughout the United States and internationally. Its Web site (www.deercrash.com) contains a large amount of DVC information and is currently being updated. The DVCIR Center also hosts an annual symposium on the DVC reduction. CERS research manager Keith Knapp is the director of the DVCIR Center.





Rural Intersection Safety. The Intelligent Transportation Systems (ITS) Institute at the University of Minnesota (www.its.umn.edu) is working with the Minnesota Department of Transportation (Mn/DOT) and several other state departments of transportation to improve the safety of rural highway intersections through the application of ITS technologies. Their efforts to develop collision-prevention technologies for rural deployment, led by ITS Institute director Max Donath, began with the Intersection Decision Support (IDS) research program. Researchers developed a system of sensors and computer processing algorithms to track vehicles approaching an intersection on a high-speed rural highway, process the data to measure gaps in traffic, and display a warning to drivers waiting on a minor road if the gap in highway traffic is too small to permit safe crossing or entry onto the highway. Following the testing of a prototype IDS data-gathering system at a rural intersection in southern Minnesota, as well as the successful deployment of a portable data-gathering system in several partner states, the Intelligent Vehicles (IV) Lab, led by Craig Shankwitz, and the HumanFIRST Program, led by Michael Manser, were selected by the Federal Highway Administration to participate in the Cooperative Intersection Collision Avoidance System—Stop Sign Assist (CICAS-SSA) research initiative. Minnesota's research, with major funding and support from Mn/DOT, focuses on developing infrastructure-based systems for rural deployment.

Rural Culture, Behavior, and Driving. Two related studies on rural culture, behavior, and driving, conducted by four University of Minnesota researchers, examined both driving behaviors as reported by rural and urban residents and actual responses to driving situations as presented in a driving simulator. In the first study, researchers concluded that any education efforts aimed at rural drivers must recognize the psychosocial and cultural factors that define a rural culture. In the second study, researchers concluded that both urban and rural drivers behaved more cautiously in an urban setting. Researchers believe cultural and environmental factors may combine to give rural drivers a false sense of security—a belief that on the highway they have a margin of error as large as the fields around them. Finding ways to bring that feeling in line with reality is a challenge to policymakers nationwide. However, the researchers recommend that whatever interventions are considered to address rural safety, they take into account the specific risks and behaviors associated with driving country roads.

Sharing Information About Rural Safety

The mission of the Center for Excellence in Rural Safety (CERS) includes not only increasing knowledge through research but also ensuring that existing and new information reaches stakeholders, policymakers, and the driving public. To spread information about rural safety, CERS pursues several avenues geared to the diverse audiences of the Center.

Information for drivers

CERS provides information for both experts in transportation and the general public. Forums most accessible to the public include:

- ♦ An active Web site, www.ruralsafety.umn.edu, which provides information on the CERS research program, conferences and other events, state-by-state crash fatality data, and innovative developments nationwide in rural safety.
- ♦ A quarterly newsletter, *Rural Safety News*, delivered via e-mail to more than 1,000 subscribers. More than 30 percent of those receiving the newsletter opened it, a rate about six times higher than most e-mail newsletters.
- ♦ Regular press releases, both written and video, to highlight important information about rural safety and the Center's research. A recent release resulted in about 30 articles or broadcast features.

Research sharing

- ♦ CERS brings together about 50 researchers and policymakers each year for a Summer Institute devoted to rural transportation safety issues. The Summer Institutes, which have been conducted annually since 2006, offer two days of intense information sharing and discussions.

Rural Highway Safety Clearinghouse

In June 2008, the Center for Excellence in Rural Safety (CERS) became home to a new national clearinghouse for information about the best ways to make rural roads safer. The Rural Highway Safety Clearinghouse, developed and maintained by CERS, is part of U.S. Transportation Secretary Mary Peters' national strategy to bring new focus, including resources and new technology, to reducing deaths on the nation's rural roads. U.S. Transportation Deputy Secretary Thomas J. Barrett, leading the U.S. Department of Transportation (USDOT) Rural Safety Initiative, unveiled the site during a news conference at the University of Minnesota.

The new clearinghouse, funded by the Federal Highway Administration (FHWA), is intended to be an easy-to-use starting point for information about safety on our nation's rural roads. The site, created as a resource especially for



*U.S. Transportation
Deputy Secretary
Thomas J. Barrett*

rural safety coalitions, provides links to safety publications and other resources grouped by safety topics including the four E's (education, emergency medical services, enforcement, and engineering). Additional topics include data and statistics, driver behavior, safety planning, seat belts, and work-zone safety.

The Rural Highway Safety Clearinghouse will report on the various activities conducted by the USDOT and other federal, state, and local partners to improve rural transportation safety. Besides supporting the USDOT Rural Safety

Initiative and facilitating rural safety partnerships, the site will collect and market best practices as well as the latest findings in rural safety research. The site has a submission form to encourage sharing of information about rural safety publications and other resources.

Visit the site at www.ruralhighwaysafety.org.

- ♦ CERS researchers have been active in presenting the results of their work through articles in academic journals and presentations at conferences for both researchers and policymakers. Presentations have been made at programs sponsored by the Transportation Research Board, the National Science Foundation, the Strategic Highway Safety Plan Peer Exchange, and regional Toward Zero Deaths public safety organizations and other regional transportation and rural planning groups. In 2007, CERS researchers conducted a roundtable for federal transportation officials from the U.S. Department of Transportation and the American Association of State Highway and Transportation Officials (AASHTO).
- ♦ CERS researchers also are developing training programs to assist rural transportation planners, including sessions for the National Rural Transportation Learning Conference, the Minnesota Rural Summit, and other national and regional organizations.

Center for Excellence in Rural Safety staff



(From left) Gina Baas, Keith Knapp, Barb Rohde, Frank Douma, Lee Munnich, Michael McCarthy, Arlene Mathison, Robert Johns, Stephanie Malinoff, Joe Loveland, and Tom Horan

Director: Lee Munnich, State and Local Policy Program, Humphrey Institute of Public Affairs

Research Director: Thomas Horan, State and Local Policy Program, Humphrey Institute of Public Affairs

Training and Outreach Director: Robert Johns, Center for Transportation Studies

Research Manager: Keith Knapp, State and Local Policy Program, Humphrey Institute of Public Affairs

Outreach Manager: Gina Baas, Center for Transportation Studies

Policy Analyst: Barb Rohde, State and Local Policy Program, Humphrey Institute of Public Affairs

Program Coordinator: Stephanie Malinoff, Center for Transportation Studies

Editor: Michael McCarthy, Center for Transportation Studies

Graphic Designer: Cadie Wright Adhikary, Center for Transportation Studies



"The Center for Excellence in Rural Safety has exceeded my expectations in raising awareness of the policy issues federal, state, and local leaders must address to significantly reduce rural road fatalities."

—*U.S. Rep. James L. Oberstar,
chairman of the House
Transportation and
Infrastructure Committee*

Center for Excellence in Rural Safety

State and Local Policy Program
Hubert H. Humphrey Institute of Public Affairs
University of Minnesota
301-19th Avenue South
Minneapolis, Minnesota 55455
www.ruralsafety.umn.edu

Writer: Mary Lahr Schier

Editor: Michael McCarthy, Center for Transportation Studies

Graphic Designer: Cadie Wright Adhikary, Center for Transportation Studies

The University of Minnesota is an equal opportunity educator and employer.

This publication is available in alternative formats upon request.

Printed on recycled paper with 10 percent postconsumer waste.



www.ruralsafety.umn.edu