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# Are We There Yet?

South Carolina Transportation Technology Transfer Service

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## The U.S. Department of Transportation Rural Safety Initiative

*Rural roads carry less than half of America's traffic, yet they account for over half of the nation's vehicular deaths. It is time to put a national focus on a local problem.*

### Objective

The focus of the U.S. Department of Transportation's (USDOT) Rural Safety Initiative is to highlight available options to help reduce highway fatalities and injuries on the nation's rural roads. This targeted national campaign will take advantage of opportunities to raise awareness of the risks drivers face on America's rural roads and provide communities with tools and assistance to address these risks where the Department's resources can be leveraged quickly and effectively.

Smarter, low-cost solutions to improve rural road safety are readily available and can be deployed quickly. This initiative seeks to refocus the Department's extensive safety programs in a

comprehensive way to help state and local leaders get solutions implemented in rural areas faster.

A May 2004 General Accounting Office report found that four key factors contribute to rural road deaths: human behavior, roadway environment, vehicles, and medical care after a crash. This document describes the Department's ongoing activities and new initiatives to highlight the issue of rural road safety and address the factors which contribute to rural fatalities.

All relevant agencies within the USDOT—the Federal Highway Administration (FHWA), the Federal Motor Carrier Safety Administration (FMCSA), the National Highway Traffic Safety Administration (NHTSA), the Pipeline and Hazardous Materials Safety Administration (PHMSA), and the Research and Innovative Technology



The LTAP Center for South Carolina

Administration (RITA)—will aid in aggressively promoting solutions, educating the public, and working with local officials to reduce injuries and deaths on rural roads.

The Department's new endeavor will encompass a comprehensive approach, addressing five focus areas:

- Safer Drivers
- Better Roads
- Better Trained Emergency Responders
- Smarter Roads
- Outreach and Partnerships

## Characteristics of Rural Crashes

By nearly every quantifiable measure, rural highway fatalities exceed the national average.

- *A Disproportionate Number of Fatalities:* Although 23 percent of the U.S. population lived in rural areas in 2006, rural fatal crashes accounted for 55 percent of all traffic fatalities.
- *Less Exposure, Yet More Fatalities:* While the majority of deaths occur on rural roads, fewer miles are driven there. In 2006, just over 1 trillion miles were driven on rural roads versus approximately 2 trillion miles on urban roads.
- *A Higher Fatality Rate:* The fatality rate per 100 million vehicle miles traveled was more than double in rural areas than it was in urban areas (2.25 and 0.93 respectively).
- *Less Seat Belt Usage in Rural Areas:* Fifty-seven percent of all the people who died on rural roads were not restrained, compared to 52 percent in urban areas. Last year, the seat belt use rate among occupants of vehicles in urban areas was 84 percent compared to 78 percent in rural areas. In 2006, 68 percent of fatally injured pickup truck drivers were unrestrained; the restraint use rate among these drivers is the lowest of any vehicle type.

- *More Speeding Fatalities:* In 2006, 12,190 drivers involved in fatal crashes were speeding; 57 percent were drivers in rural areas.
- *More Impaired Driving Fatalities:* Of the passenger vehicle occupant fatalities involving impaired driving crashes (BAC .08+) in 2006, 58 percent were in rural areas. At most blood alcohol concentration (BAC) levels, the percent of rural drivers involved in fatal crashes exceeds the percent of urban drivers involved at the same BAC.
- *A Lethal Combination:* In 2006, rural drivers made up 62 percent of total drivers found to have been drinking, speeding, and unrestrained.
- *Post-Crash:* In 2006, 66 percent of rural drivers killed in crashes died at the scene, compared to 51 percent of urban drivers. Seventy-two percent of drivers who died en route to a hospital were in rural areas.
- *Most Fatalities Occur on Two-Lane Rural Roads:* Nearly 50 percent of total highway fatalities occur on two-lane rural roads. The fatality rate overall on local roads is more than twice that of interstates.

## Solutions

Safety has always been the hallmark of the U.S. Department of Transportation, and continues to be the top priority. While great progress has been made in improving safety and reducing deaths nationally, the number of rural highway fatalities remains disproportionately large. This initiative is designed to bring new focus and a comprehensive approach to encourage safer drivers, better and smarter roads, better trained emergency responders, and stronger partnerships to help improve safety on America's rural roads.



## I. Safer Drivers

**Seat Belts and Ignition Interlocks:** NHTSA will fund four demonstration projects in rural areas to raise seat belt usage and/or promote greater deployment of ignition interlocks to combat drunk driving by repeat offenders. This program will offer grants to recipients to implement either of the following initiatives:

- *Increasing Seat Belt Use in Rural Areas:* This approach would focus on the visibility of enforcement in several low belt use counties in an effort to raise the overall seat belt use rate. This strategy is now being tested in Wyoming and North Dakota. The grant amount for this program is \$300,000 per recipient.
- *Increasing Use of Ignition Interlocks in Rural Areas:* Local jurisdictions in rural areas will demonstrate strategies for overcoming identified challenges to the use of interlocks, which are devices used to prevent intoxicated drivers from starting their vehicle. States would identify problems, such as the reluctance of courts in rural areas to require installation of interlocks. The grant amount for this program is \$100,000 per program.

**Sobriety Checkpoints:** A concern smaller rural agencies have expressed is their ability to effectively conduct sobriety checkpoints due to a lack of resources. However, NHTSA has sponsored research that shows low staffing checkpoints (operated by five or fewer officers) can be just as effective as more traditional, larger checkpoints (20 or more officers). NHTSA has published guidelines and will continue to work with State and local officials to increase the use of low staffing checkpoints.

**Preventing Rollovers:** Higher-speed roads with curves and grades, fewer lanes, narrow or no shoulders, and ditches near the road are factors which contribute to vehicle loss-of-control in rural areas. Rollovers are particularly problematic in rural areas: 41 percent of passenger vehicle occupant fatalities in rural areas involved rollovers, versus 26 percent for urban areas. In 2007, NHTSA issued a Final Rule for Electronic Stability Control (ESC), which will significantly reduce rollovers. ESC helps the driver maintain control of the vehicle when it is dangerously under or over-steered. When fully deployed into the fleet, it is estimated that ESC will reduce single-vehicle crashes of passenger cars by 34 percent and single-vehicle crashes of sport utility vehicles by 59 percent.

In addition to ESC, NHTSA is developing performance standards to protect occupants during a rollover crash. New safety measures have been evaluated, including side curtain air bags designed to prevent rollover ejection. NHTSA expects to publish an NPRM for a rollover ejection mitigation requirement in 2008 and a final rule in 2009.

**Commercial Vehicles:** FMCSA is working with states to develop strategies for ensuring the safety of commercial vehicles on rural roadways and to include a component on rural commercial vehicle safety into each state's annual Commercial Vehicle Safety Plan. This year's guidance from the Department will focus on large truck fatalities occurring in work zones. Preliminary data shows that large-truck, work-zone fatalities account for nearly 5 percent of the approximately 5,000 large truck deaths each year. States will be requested to identify rural road crash and fatality problems and use grant funding to focus safety efforts in those areas.

## II. Better Roads

**Improving High Risk Rural Roads (HRRR):** This program within the Highway Safety Improvement Program is available to states for high risk rural road projects under a provision in the most recent highway reauthorization law, SAFETEA-LU. Historically, the program has been underutilized as states have chosen to focus their funding on other priorities. The funds may be used for construction or operational improvements, such as adding or expanding shoulders, straightening dangerous curves, and improving hazardous intersections. Through December 2007, states have only obligated an estimated \$26 million of the \$269 million (\$90 million was set aside per year for fiscal years 2006 to 2008) in available HRRR program funds to improve safety on rural roads. The Department's goal is to encourage states to tap into all the funding Congress has provided for this program.

**Improving Rural Roads in the Delta Region:** Approximately \$9.2 million in available FY 2008 funding for the Delta Region Transportation Development Program will be targeted toward funding innovative safety projects in the Delta region, which consists of 240 counties in Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee. Typical projects include innovative safety infrastructure improvements, such as cable median barriers and rumble strips; innovative intersection improvements such as roundabouts; corridor safety improvements; and adding ITS features to infrastructure. Many of these solutions are relatively low cost, allowing states the opportunity to quickly and efficiently improve safety on rural roads.

**Safety Circuit Rider:** The Safety Circuit Rider pilot program is aimed at reducing crashes on two-lane rural roads by providing technical assistance and best practices for improving safety to local agencies. This highly successful pilot program has been tested in Kentucky, Florida, West Virginia, and the Northern Plains Tribal Technical Assistance Program Center in North Dakota. Where improvements have been implemented in these states, crashes have been

reduced. Twenty other states are implementing local safety circuit rider programs, and in September 2008, FHWA will publish a manual of proven safety measures to support further development and implementation.

### III. Smarter Roads

**University-Based Rural Safety Research:** Sponsored by FHWA, the University of Minnesota's Center for Excellence in Rural Safety (CERS) was established in SAFETEA-LU to provide research, training, and outreach on innovative uses of technology to enhance rural safety and economic development; assess local community needs to improve access to mobile emergency treatment; and develop online and seminar training for rural transportation practitioners and policy-makers.

Leading UTC research includes the development of an animal detection system that warns drivers in rural areas when wildlife such as deer and elk are on or near the roadway (Montana State's Western Transportation Institute); field testing and analysis of collision avoidance technology at non-signalized rural highway intersections (University of Minnesota's ITS Institute); analysis and recommendations for reducing night-time rural intersection collisions caused by ineffective road lighting (Iowa State); and analysis of factors contributing to accidents on two-lane rural roads (University of Washington).

**Speed Management:** This year, NHTSA and FHWA will work closely with states and rural communities to determine the best way to set speed limits on rural arterial and connector roads based on engineering data. Setting rational speed limits shows significant promise at reducing motor vehicle crashes on rural arterials and connectors. This outreach and technical assistance builds on NHTSA and FHWA field tests, in which speed limits were set based on engineering studies. Using a new baseline for the new speed limit determination, the tests largely led to increasing the existing, posted speed limit by five to 15 miles per hour. The public overwhelmingly supported the new speeds, and compliance with the new speed limit increased from 5 percent to almost 50 percent.

**Smarter Roads through ITS Technology:** RITA will make \$6 million available for partnerships with rural communities to test and expedite the deployment of Intelligent Transportation Systems (ITS) technologies and innovations that will reduce accidents on rural roadways. The Department's ITS program focuses on providing drivers with real-time safety warnings, dynamic traffic and transit information, and advanced navigational tools to prevent accidents and ease congestion. The ITS program works collaboratively with industry to develop intelligent vehicles and intelligent infrastructure that can communicate to improve safety. Safety enhancements that are or will

soon be available as a result of ITS technologies include:

- Intersection and vehicle-based collision avoidance systems (i.e., sensors to provide oncoming traffic alerts, pedestrian and obstruction detection systems, dynamic message/warning signs, automatic braking systems);
- Lane departure warning systems to warn drivers when vehicles leave the roadway;
- Variable speed limits and roadway indicators that adjust based on conditions;
- Dynamic curve warning systems to warn drivers through dynamic signs or eventually direct communication with the vehicle;
- Road weather information systems that help officials know when deicing materials are needed;
- Stop-sign-controlled intersection technology that provides vehicles with real-time information about gaps in oncoming traffic to help drivers make safer turns;
- Emergency communications systems such as 911 dispatchers to send and receive digital pictures, video, e-mail, and text messages so that emergency personnel can respond quickly and appropriately to incidents; and,
- Real-time 511 information services, traffic, weather, and navigation.

The Department will select rural partner communities with significant and quantifiable safety hazards that have identified high-impact, leading-edge ITS solutions and work with these communities to test the new technologies. Results will be evaluated, and examples and best practices will be published for other rural communities that are facing similar safety challenges.

Further information on potential safety applications of ITS in rural areas can be found at <http://www.itsdocs.fhwa.dot.gov/index.htm> or <http://www.its.dot.gov/index.htm>.

### IV. Better Trained Emergency Responders

The Automatic Crash Notification and Wireless Enhanced 9-1-1: Rapid, accurate location of motor vehicle crashes combined with excellent post-crash emergency medical care is essential to reducing rural road deaths. In rural areas, emergency response to crashes faces a variety of challenges, including delays in the discovery of the crash, sporadic cell coverage hindering the placement of an emergency call, dispatching emergency responders, and the long distances to reach crash victims and transport them to medical care.

The Automatic Crash Notification and Wireless Enhanced 9-1-1 projects will provide geographic location information that enables emergency responders to locate motor vehicle crashes, as well as provide crash mechanism data that helps to predict serious injury. Next Generation

9-1-1 technology improves transmission of these data, helps ensure the correct emergency services are promptly dispatched, improves triage decisions by dispatch and EMS personnel, and expedites both the delivery of emergency services and the transportation of patients to definitive medical care.

This year, NHTSA will initiate a grant program that will assist public safety answering points (PSAPs) in upgrading their capability to receive emergency calls from Geographical Information System (GIS)-enabled cell phones and determine the geographic location of the caller. The Department is currently working with Helena, Montana; Rochester, New York; Seattle, Washington; St. Paul, Minnesota; and the State of Indiana to test the capability of the Next Generation 9-1-1 network to transmit digital pictures, video, email, and text messages that will give emergency personnel the critical information they need to respond quickly and appropriately to incidents.

**Hazardous Materials Emergency Preparedness (HMEP) Grants Program:** Administered by PHMSA, HMEP grants help rural communities respond to hazardous material emergencies. The \$28 million grant program will:

- **Help Re-Establish Local Emergency Planning Committees (LEPCs) in Rural Communities:** This will increase the number of rural trained volunteer emergency responders. Currently there are as many as 1,700 inactive LEPCs in rural America. Re-activated LEPCs will be eligible to receive HMEP grants for training and planning activities and help increase the number of volunteers trained in operations-level hazardous materials response.
- **Identify Rural Hazmat Challenges:** PHMSA, working in partnership with the U.S. Fire Administration (USFA), and emergency response organizations will help volunteer emergency responders plan and train for hazardous materials transportation incidents.
- **Develop curriculum and technical assistance programs:** Work with other federal agencies, including EPA, DOE, FEMA, and the USFA/DHS National Fire Academy, to develop innovative new curricula and technical assistance programs that specifically target improving rural community hazardous materials planning and response capabilities, including guidelines for responding to alternative energy product spills.

## V. Outreach and Partnerships

**Training and Technical Support:** FHWA has developed and continues to offer a number of courses directly related to rural roadway safety, including : Roadway Safety Fundamentals, Rural Road Safety Audits, Low Cost Safety

Countermeasures, and Common Sense Intersection Solutions. Additional training packages on intersection without signals and other low-cost safety solutions are currently under development.

FHWA is making available safety guidance and technical documents to targeted rural owners, including specialized guidance on low-cost safety fixes for dangerously-curved roads, incorporating safety into resurfacing projects, proper maintenance of water run-off safety features, and guardrail repair and safety upkeep. FHWA also provides extensive guidance and technical support for the installation of shoulder and centerline rumble strips, a specific, low-cost infrastructure solution that is particularly relevant for rural roads.

<http://www.dot.gov/affairs/ruralsafety/ruralsafetyinitiativeplan.htm>.



## Efforts to Limit Cell Phone Use While Driving Grow

USA Today

More than 250 bills prohibiting or restricting cell phone use while driving are pending in 42 state legislatures despite disagreement over the risks cellphones pose and the effectiveness of enforcement. The number is up from about 120 bills in just 18 states 10 months ago, according to an analysis by the Insurance Institute for Highway Safety, a safety research group funded by insurers. Four states—Georgia, Idaho, North Carolina and Texas—are considering banning all types of cellphone usage behind the wheel, including hands-free devices.

Watching that legislation are wireless carriers and automakers, which have invested millions of dollars in hands-free technology built into vehicles. At least one insurer is also taking action: Nationwide will soon offer discounts to parents who buy technology that disables their teens' phones while their vehicles are in motion.

Six states plus the District of Columbia currently ban handheld cellphone use while driving. Legislators in 23 states have introduced bills to allow only hands-free phoning.

At the end of 2008, CTIA-The Wireless Association estimated that 270 million people—about 90 percent of the U.S. population—had cellphones. The latest data available from the National Highway Traffic Safety Administration estimated that in 2007, about 11 percent of the population at any moment during the day used a phone while driving.

Some of the legislative activity was prompted by the National Safety Council, which in January declared hands-free calling as dangerous as holding a phone. John Ulczycki, its vice president of research, communication and advocacy, says he's been meeting with state officials for several weeks encouraging them to introduce bills banning all forms of in-car cellphone use other than emergency calls. The group, funded by more than 20,000 companies, hopes to persuade Congress to offer financial incentives to states that pass such laws.

"When our friends have been drinking, we take the car keys away," says Janet Froetscher, CEO of the safety council. "It's time to take the cellphone away."

The tough talk is despite disagreement over cellphone risks by leading academic and industry researchers. "Unlike with seat belt and drunk-driving legislation, there's no consensus as to what an effective cellphone law entails and also no evidence that these ... approaches have any impact," says Barbara Harsha of the Governors Highway Safety Association.

## Rough Roads Ahead

Driving on rough roads costs the average American motorist approximately \$400 a year in extra vehicle operating costs. Drivers living in urban areas with populations over 250,000 are paying upwards of \$750 more annually because of accelerated vehicle deterioration, increased maintenance, additional fuel consumption, and tire wear caused by poor road conditions.

### A Snapshot of Rough Roads

- Only half of the nation's major roads are in good condition.
- One in four urban roads is in poor condition.
- Major urban centers have the roughest roads—some with more than 60 percent of roads in poor condition.
- Rural roads are in better condition than urban roads. In 2007, 60 percent of rural roads were in good condition.
- Overall, 72 percent of the Interstate Highway System is in good condition. But age, weather conditions and burgeoning traffic—particularly multi-axle trucks—are eroding ride quality. In eight states, 20 percent of the Interstate highways were rated as mediocre or poor.

*Rough Roads Ahead: Fix Them Now or Pay for It Later*, a report released today by the American Association of State Highway and Transportation Officials (AASHTO) and TRIP, reports that one-third of the nation's major highways, including Interstates, freeways, and major roads, are in poor or mediocre condition. Roads in urban areas, which carry 66 percent of the traffic, are in much worse shape.

Read the full report at <http://roughroads.transportation.org>.



# Selling your Public Works Budget to Your Board and the Public



In these difficult economic times, it is even more critical that you can successfully sell your public works budget to the elected officials of your local agency and to the public. Here are a few tips from Hank Lambert, former Director of the Vermont Local Roads Program, who developed a training program on Budgeting for Public Works Professionals.

## Develop a concise summary of the budget

A concise summary and guide for informing the Board and involving the public is valuable. There is no set format. It may include a transmittal letter, a budget message, an executive summary, a budget-in-brief. At a minimum, a summary should do the following:

1. Summarize the major changes in priorities or service levels from the current year and the factors leading to those changes.
2. Articulate the priorities and key issues for the new budget period.
3. Identify and summarize major financial factors and trends affecting the budget, such as economic factors; long-range outlook; significant changes in revenue collections, tax rates, or other changes; current and future debt obligations; and significant use of or increase in fund balance or retrained earnings.
4. Provide financial summary data on revenues, other resources, and expenditures for at least a three-year period, including prior year actual, current year budget and/or estimated current year actual and proposed budget.

## Tips for presenting the budget to your Board and to the public

Ask First: “Have I fully involved my staff in developing the

department’s budget?”

1. Tailor your presentation to the situation, and what you want the Board (and the public) to decide. Begin with an overview of the presentation.
2. Revenue section
  - a. Explain key assumptions in developing revenue projections
  - b. Show anticipated revenues by source
3. Expenditure section
  - a. Explain key assumptions: inflation rates, staff turnover, anticipated increases
  - b. Show expenditures by program
  - c. Project changes in salaries and fringe benefits
4. Program Section
  - a. Briefly explain new requirements
  - b. Give status reports on programs and success of new initiatives
  - c. Explain proposed new program initiatives and justification: pay for itself, will improve efficiency; will improve performance/safety/liability. Stress benefits to be achieved.
5. Focus on what interests members of the audience (support existing programs, new programs, effect on property taxes, and staffing)
6. Discuss implications of the budget (facilities, taxes, debt); show benefits if passed; explain the consequences if the budget is cut.

The Technology Transfer Center of Connecticut brings this valuable training to Connecticut as a part of its Road Scholar program and its new Transportation Leadership Academy. ♡

*Technology Transfer Center  
University of Connecticut*

# Safety Zone



## Nine Proven Safety Countermeasures

By Randy Warden, Matt Schmitz, and Ken Kochevar, Federal Highway Administration

The Federal Highway Administration (FHWA) is committed to saving lives and preventing injuries and has identified countermeasures from state and local agencies across the nation that have outstanding potential for improving highway safety. These are known as the “Nine Proven Safety Countermeasures.”

The following information includes descriptions of the nine identified countermeasures, contact information, general cost information, benefits, and sources for additional information. The countermeasures are based on effectiveness data for various crash types compiled from a variety of sources. Their use reflects the types of circumstances and situations that FHWA is confident will yield high benefit/cost rewards on a project-by-project or systematic basis.

### 1 Road Safety Audits

A Road Safety Audit (RSA) is a safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team.

**Cost:** Very low. Costs are in the form of time and team coordination.

**Data and Benefits:** Crash reduction percentages up to 60% have been recorded on past projects where a RSA was done. Lifecycle costs are reduced since safer designs often carry lower maintenance costs. Safer roads and reductions in severe crashes reduce the societal costs of collisions.

**FHWA South Carolina Contact:**  
**Craig Allred:** [Craig.Allred@dot.gov](mailto:Craig.Allred@dot.gov)

**On the web:** [safety.fhwa.dot.gov/rsa](http://safety.fhwa.dot.gov/rsa)

### 2 Rumble Strips and Rumble Stripes

Rumble strips are ground into the pavement and are outside of the travel lane. Rumble strips are ground into the pavement and painted over with the appropriate striping.

**Cost:** Low. Cost will vary based on the application. Prices range between \$0.20 and \$3.00 per linear foot.

**Data and Benefits:** More than 43% of South Carolina’s fatal crashes are a result of road departure. This application provides an audible warning and physical vibration to alert drivers they are leaving the roadway. The application of rumble stripes or strips has shown good results in reducing run off the road (ROR) crashes.

**FHWA South Carolina Contact:**  
**Frank Julian:** [Frank.Julian@dot.gov](mailto:Frank.Julian@dot.gov)

**On the web:** [safety.fhwa.dot.gov/roadway\\_dept/rumble/index.htm](http://safety.fhwa.dot.gov/roadway_dept/rumble/index.htm)

### 3 Median Barriers

Median Barriers separate opposing traffic on a divided highway and are used to redirect vehicles striking either side of the barrier.

**Cost:** Medium to high. Will vary depending on the material used. Cable barrier systems can be installed on average for \$76,500 per mile.

**Data and Benefits:** Cross-median crashes can be some of the most severe and most result in a serious injury or death. Median Barriers can significantly reduce the occurrence of cross-median crashes and the overall severity of median-related crashes.

**FHWA South Carolina Contact:**  
**Dick Albin:** [Dick.Albin@dot.gov](mailto:Dick.Albin@dot.gov)

**On the web:** [safety.fhwa.dot.gov/tools/median\\_barrier.htm](http://safety.fhwa.dot.gov/tools/median_barrier.htm)

### 4 Safety Edge

Safety Edge is a paving technique where the interface between the roadway and graded shoulder is paved at an angle to eliminate vertical drop-off.

**Cost:** Very low. The technique requires a slight change in the paving equipment (approximately \$1,200).

**Data and Benefits:** Research between 2002 and 2004 shows that pavement edges may have been a contributing factor in as many as 15% to 20% of run-off-the-road crashes. When a driver drifts off the roadway and tries to steer back onto the pavement the action may result in over-steering. Safety Edge minimizes that occurrence by reducing the vertical angle between the shoulder and pavement.

**FHWA South Carolina Contact:**  
**Frank Julian:** [Frank.Julian@dot.gov](mailto:Frank.Julian@dot.gov)

**On the web:** [safety.fhwa.dot.gov/roadway\\_dept/docs/sa07023/](http://safety.fhwa.dot.gov/roadway_dept/docs/sa07023/)

## 5 Roundabouts

Roundabouts are circular intersections with specific design and traffic control features that ensure low travel speeds (<30mph) through the circulatory roadway.

**Cost:** High. Installations may require additional right of way.

**Data and Benefits:** A reduction in serious crashes may justify the costs. Roundabouts offer substantial safety advantages and can reduce the occurrence of right angle crashes and have the potential to reduce fatal and injury crashes from 60% to 87%. Geometric features provide a reduced speed environment and excellent operational performance.

**FHWA South Carolina Contact:**  
**Mark Doctor:**  
[Mark.Doctor@dot.gov](mailto:Mark.Doctor@dot.gov)

**On the web:** [www.tfhrc.gov/safety/00068.htm](http://www.tfhrc.gov/safety/00068.htm)

## 6 Left and Right Turn Lanes

Installation of turn lanes reduces crash potential, motorist inconvenience, and improves operational efficiency.

**Cost:** Medium to high. Some installations may require additional right of way.

**Data and Benefits:** Rear-end crashes are the most frequent type of collisions at intersections. Adding turn lanes provides separation between turning and through traffic and reduces these types of conflicts. It is desirable to offset opposing left turn lanes to increase visibility of approaching vehicles.

**FHWA South Carolina Contact:**  
**Gene Amparano:**  
[Gene.Amparano@dot.gov](mailto:Gene.Amparano@dot.gov)

**On the web:** [safety.fhwa.dot.gov/intersections/intersectionsap.htm](http://safety.fhwa.dot.gov/intersections/intersectionsap.htm)

## 7 Yellow Change Intervals

Yellow change intervals should be appropriate for the speed and distance traveled at a signalized intersection.

**Cost:** Very low. Time and interagency coordination are required.

**Data and Benefits:** Yellow change intervals that are not consistent with normal operating speeds create a dilemma zone in which drivers can neither stop safely nor reach the intersection before the signal turns red. Increasing yellow time to meet the needs of traffic can dramatically reduce red light running.

**FHWA South Carolina Contact:**  
**Fred Ranck:** [Fred.Ranck@dot.gov](mailto:Fred.Ranck@dot.gov)

**On the web:** [safety.fhwa.dot.gov/intersections/rlr\\_report/chap3.htm](http://safety.fhwa.dot.gov/intersections/rlr_report/chap3.htm)

## 8 Median and Pedestrian Refuge Areas

Median and pedestrian refuge areas provide additional protection for pedestrians and lessen their risk of exposure to oncoming traffic.

**Cost:** Low. Retrofit improvement, even lower costs for new roadway projects.

**Data and Benefits:** Pedestrian fatalities account for approximately 11% of all fatalities in South Carolina. Providing raised medians or pedestrian refuge areas has demonstrated a 46% reduction in pedestrian crashes. Raised medians or refuge areas are especially important at multi-lane intersections with high volumes of traffic.

**FHWA South Carolina Contact:**  
**Rudy Umbs:**  
[Rudolph.Umbs@dot.gov](mailto:Rudolph.Umbs@dot.gov)

**On the web:** [safety.fhwa.dot.gov/ped\\_bike/univcourse/swless15.htm](http://safety.fhwa.dot.gov/ped_bike/univcourse/swless15.htm)

## 9 Walkways

Pathways, sidewalks, or paved shoulders should be provided wherever possible, especially in urban areas and near school zones where there are high volumes of bikes and pedestrians.

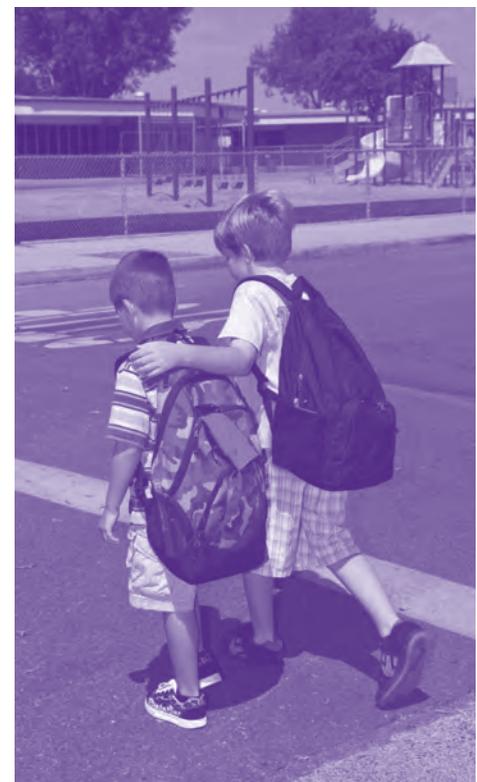
**Cost:** Medium to high. Based on the amount and type of application.

**Data and Benefits:** “Walking along road” pedestrian crashes account for approximately 7.5% of all pedestrian crashes. The presence of a path, sidewalk or paved shoulder can provide a significant reduction in “walking along road” pedestrian crashes.

**FHWA South Carolina Contact:**  
**Rudy Umbs:**  
[Rudolph.Umbs@dot.gov](mailto:Rudolph.Umbs@dot.gov)

**On the web:** [www.fhwa.dot.gov/environment/bikeped/design.htm#d4](http://www.fhwa.dot.gov/environment/bikeped/design.htm#d4)

For more information about the Nine Proven Safety Countermeasures, visit [safety.fhwa.dot.gov/policy/memo071008.htm](http://safety.fhwa.dot.gov/policy/memo071008.htm).



## 3M Sign Grant

The FHWA has finalized comprehensive changes to signing standards. These new standards will require government agencies to maintain minimum levels of reflectivity on traffic signs and an upgrade to higher performance reflective sheeting may be necessary. The purpose of this grant is to help provide financial support to government agencies that want to upgrade signage to align with the new FHWA minimum standards and improve safety.

### Grant criteria:

- Applicant must be a government agency located in the United States.
- Agency is committed to upgrading sign standards from Type I or II (engineer grade) to Type III/IV/X or Proposed Type XI (prismatic material), or from Type III/IV/X to Proposed Type XI.

3M invites you to apply for a grant. Go to [http://solutions.3m.com/wps/portal/3M/en\\_US/3M\\_Sign/Grant/](http://solutions.3m.com/wps/portal/3M/en_US/3M_Sign/Grant/) to apply for your grant. Before applying for a grant you will be asked to set up an account with a specific user name and password. This will allow you to save your information and return to it at a later date. You will then be asked to provide some information about you and your agency. Upon completing the required information you will then be able to begin applying for a grant.

This grant application requires a minimum request of 500 square feet of sheeting but there is no maximum limit on the amount of sheeting you can request. Please note that the grant is not intended to cover the total cost of either roll goods or finished signs. The grant is determined based on the square feet of retro-reflective sheeting material requested. The 3M Sign Grant may provide a savings of 30 to 50 percent off the cost of sheeting material based on the amount and type of sheeting material purchased.

### Grant Guidelines:

1. The grant must be used to upgrade current sign materials from Type I or II (engineer grade) to Type III/IV/X or Proposed Type XI (prismatic material), or from Type III/IV/X to Proposed Type XI. 3M reserves the right to reject any grant applications that do not meet this criterion.
2. The grant must be used within 90 days of the grant award date.
3. Orders must specify 3M™ High Intensity Prismatic Sheeting (Type III/IV/X) or 3M™ Diamond Grade™ DG<sup>3</sup> Reflective Sheeting (Proposed Type XI).
4. The grant number must be supplied at the time of the order whether direct with 3M or through a sign fabricator.

5. The order placed directly with 3M or a fabricator must correspond to the information submitted in the grant application.
6. The entire grant must be redeemed against one order.
7. Grant applications for both roll goods (in-house fabrication) and finished signs or sign faces (from a sign fabricator) will receive two separate grant numbers for ordering purposes. When applying for both, they must be applied for on the same application.

Only one grant is available per agency. ↘



## Information Request and Address Change Form

Videos and publications from our library are available on-line at [www.clemson.edu/t3s](http://www.clemson.edu/t3s).

The videos and publications are free to individuals employed by any city, county, or state government agency in South Carolina. You can obtain a free single copy of most publications, or borrow a copy of one of our “for loan” publications and videos.

### Transportation Technology Transfer Service

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

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### Videos

- Asphalt Roadway Rehabilitation, FWHA,*  
This video describes the Local Technical Assistance Program (LTAP) training course on asphalt roadway rehabilitation.
- Base and Sub: Base Repair, IRF,*  
This video outlines the nine-step base repair system which includes placing traffic control devices, marking repair limits, cutting pavement, removing unsuitable material, installing sub-grade and base, replacing pavement, and cleaning up and removing traffic control devices.
- Chip Seal Application, FWHA,*  
This video describes three parts to applying chip seals.  
Part 1: Shows preliminary concerns, materials, equipment, surface preparation, weather requirements, and application rates. Part 2: Discusses chip seal procedures, binder application, chip spreading, and roller operation. Part 3: Details problems that can occur, and their solutions.
- Crack Repair in Asphalt Pavement, IRF,*  
This video describes the repair of small cracks, linear or area in nature, required tools and equipment, materials, placing signs, cleaning out cracks, filling cracks with asphalt mixture, applying liquid asphalt, spreading cover aggregate, rolling aggregate, cleaning site, and removing traffic control devices.
- Crack Sealing, Penn DOT,*  
This video describes the requirements for proper crack sealing of bituminous surface, such as materials, equipment preparation, sealing, and safety.
- Pavement Condition, Deighton,*  
This video tells how and why pavement deterioration occurs, and how to measure condition.
- Pothole Patching, FWHA,*  
This video discusses the causes of potholes, equipment needed for repair, and six steps for proper repair.
- Pothole Repair in Asphalt Concrete Pavement, IRF,*  
This video discusses the tools and equipment required, and the procedures for repair including: placing of signs, marking damaged areas, cutout and removal of bad material, filling hole with granular material, compacting, sealing the surface, cleaning up the site, and removing traffic control devices.
- Potholes: Causes, Cures, and Prevention, US Army Corps. of Engineers,*  
This video discusses how potholes develop, how they should be properly repaired, and how to develop a pothole repair program, along with preventive techniques.

## SPEED BUMP

Dave Coverly



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### How to Contact Us

SC Transportation Technology Transfer Service  
Civil Engineering Department  
Clemson University—Box 340911  
Clemson, SC 29634-0911  
Phone: 888-414-3069 Fax: 864-656-2670  
E-mail: [t3s@clemson.edu](mailto:t3s@clemson.edu)  
Web: [www.clemson.edu/t3s](http://www.clemson.edu/t3s)

Director:	Jim Burati	864-656-3315
Program Manager:	Sandi Priddy	864-656-6141
Designer/Assistant Editor:	Ardi Kinerd	864-656-6141

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Transportation Technology Transfer Service  
Civil Engineering Department  
Clemson University  
Box 340911  
Clemson, SC 29634-0911