T3S

Are We There Yet?

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In This Issue...

When Should You Pave a Gravel Road?

You might think that anyone living near a gravel road would be waiting anxiously for it to be covered with asphalt. For bedroom communities in rural areas, this may be true.

For farmers or others who need to drive heavy loads as the frost begins to move out of the asphalt surface, the resulting damage, and resulting higher maintenance and tax costs, may mean that gravel continues to be their surface of choice.

Paved roads can provide options to gravel in ways that are hard to quantify with dollars—including improved winter surfaces; improved safety from improved signage and delineation; safer surfaces with higher skid resistance; smoother surfaces that increase some users' satisfaction; if the route does not carry heavy loads in early spring, reduced road and vehicle maintenance costs; redistribution of traffic away from gravel roads; and an increased tax base on adjacent property.

Nearly half of our nation's 4 million miles of road are unpaved, meaning we have about 1.5 million miles of roads without paving.

These roads serve a valued purpose in our roadway system, yet maintenance costs are significant. Paved roadways can also be costly to maintain. So, how can engineers and road authorities decide when it makes sense to upgrade a gravel road to a paved one?

Resources

Maintenance logistics and costs are part of the decision-making process. Two key questions should be answered when developing a gravel road maintenance plan:

1. What is the best way to maintain a gravel road?
2. When should the roadway be upgraded to a paved surface?

Many factors affect the answers. Two newly published research reports, one by

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Considering Sustainability in Construction

By Dr. Leidy Klotz

Greetings all. I am thrilled to be joining the Civil Engineering faculty at Clemson starting with the Fall '08 semester! My primary teaching and research activities deal with sustainability in the built environment. I gained valuable experience in this area while earning my Ph.D. at Penn State and while working in a project management role for five years with Bovis Lend-Lease in New Jersey. A primary reason Clemson was at the top of my job-search list is the vast potential for applying this background to enhance the curricula and provide research experiences for students at Clemson. I also recognized the opportunities to collaborate with industry through groups such as the Construction Industry Cooperative Alliance and the South Carolina Transportation Technology Transfer Service. As you know, this collaboration is essential to ensuring that research projects tackle "real" questions and that the results are disseminated to those who can use them.

My overarching career goal is to help minimize the negative impacts of our built environment by improving the delivery of sustainable projects. Global climate change and shortages of critical resources including energy and water are among the most important issues facing humanity at the beginning of the 21st century. Expanding population and continued development necessitates visionary research and development efforts seeking groundbreaking solutions (e.g., novel sources of clean energy and economically feasible carbon sequestration strategies) for future application. In the meantime, proven solutions already exist and their broad application could immediately address these issues in a significant way. For example, using existing strategies and technologies, the United States could reduce its global warming emissions 50% by 2050.

Reducing the environmental impacts of our built environment is a critical part of the current response. The construction and operation of buildings alone have massive worldwide impacts, accounting for 40% of all material and energy flows. This represents more energy usage and global warming emissions than automobiles and planes combined, over 10% of waste streams, and over 10% of potable water use. Sustainable buildings are those designed to reduce these impacts, and there is great potential for the worldwide application of sustainable building. My research at Penn State examined the hypothesis that improved process transparency can lead to lower costs for sustainable buildings. Effective delivery of a sustainable building relies on an integrated process with countless interactions between diverse stakeholders who are working together to generate sustainable solutions. Process transparency enables stakeholders to see and understand the status of a process at all times. Limited theoretical evidence suggests that process transparency can assist effective sustainable building delivery. My research builds on this theoretical evidence by empirically investigating the impact of process transparency on two recently completed building projects that earned Leadership in Energy and Environmental Design (LEED) Gold and Silver certification respectively. Costs associated with each project's actual delivery were compared to costs associated with a "counterfactual" delivery of the same project with complete process transparency. Primary contributions of this research include a rigorous method for applying counterfactual analyses to project delivery and evidence that reduced costs for sustainable buildings are possible by increasing delivery process transparency.

At Clemson, I plan to expand on this work to look at different project types as well as features, other than transparency, with potential to improve delivery of sustainable building projects. To complement my research on sustainable project delivery, I also plan to study sustainability in engineering education. I taught sustainable construction courses to undergraduate and graduate students at Penn State. Because these courses were relatively new, I participated in their development, and will draw on this experience to develop and implement similar courses targeted to students and professionals associated with Clemson.

Again, I am thrilled to be joining the Clemson family and cannot wait to start contributing.

US DOT 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 (DOT) 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.

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

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

Challenges

Of the 8.4 million lane-miles of roads in the United States, over 6 million lane-miles are rural. Almost 80 percent of rural roads are owned and operated by local entities, making the dissemination of highway safety information to local officials and the public critical to improving national rural road safety.

Rural areas face a number of unique highway safety challenges. Rural crashes are more likely to be at higher speeds than urban crashes; victims of fatal crashes in rural areas are more likely to be unbelted than their urban counterparts; and it often takes first responders longer to arrive at the scene of a rural crash, leaving victims waiting longer for medical attention. Outdated roadway design and roadside hazards such as utility poles, sharp-edged pavement drop-offs, and trees close to the roadway also are major contributors to the severity of rural crashes.

Rural Fatalities

According to the latest data from NHTSA's Fatality Analysis Reporting System (FARS), the fatality rate for rural crashes is more than twice the fatality rate in urban crashes. In 2006, 23,339 people were killed in rural motor vehicle crashes, accounting for 55 percent of all motor vehicle fatalities. Table 1 shows fatalities (number and percent) and the fatality rate by year from 1997 to 2006.

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 verses 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.

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Table 1: Fatalities and Fatality Rate by Rural/Urban Roadway by Year

Year	Rural Roadway			Urban Roadway			Total*	
	Fatalities	%	Rate**	Fatalities	%	Rate**	Fatalities	Rate**
1997	25,135	60%	2.52	16,829	40%	1.08	42,013	1.64
1998	25,185	61%	2.44	16,219	39%	1.02	41,501	1.58
1999	25,548	61%	2.40	16,058	38%	0.99	41,717	1.55
2000	24,838	59%	2.29	16,113	38%	0.97	41,945	1.53
2001	25,150	60%	2.27	16,988	40%	1.01	42,196	1.51
2002	25,896	60%	2.30	17,013	40%	0.98	43,005	1.51
2003	24,957	58%	2.30	17,783	41%	0.98	42,884	1.48
2004	25,179	59%	2.36	17,581	41%	0.93	42,836	1.44
2005	24,587	57%	2.38	18,627	43%	0.95	43,510	1.46
2006	23,339	55%	2.25	18,359	43%	0.93	42,642	1.41

Source: NCSA, FARS 1997-2005 (Final), 2006 (ARF), FHWA

*Total includes fatalities on unknown roadway

** Fatality rate per 100MVMT

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Minnesota's Local Road Research Board and one from the South Dakota Department of Transportation, provide some direction and assistance.

Economics of Upgrading an Aggregate Road (2005-09), published by Minnesota's Local Road Research Board, offers an analysis of county maintenance costs, practices, and traffic volumes for individual roads. This information helps to determine when to upgrade a road based on cumulative maintenance costs. The data presented in the report can be used by other states and localities, or it can be used as a resource to develop a similar methodology with local data.

The initial data collection included 16 Minnesota counties, broken into four regions around the state. It includes maintenance costs for both bituminous (or asphalt) and gravel roads, as well as the volume of traffic traveling over the roads. Baseline data was obtained from annual reports submitted to the Minnesota Department of Transportation's State Aid Division from 1997 to 2001, and roads were grouped by funding source as County State Aid Highways, county roads (funded entirely by county funds), and township and municipal roads.

Four of the counties were analyzed further to develop typical costs per mile for a variety of surface options, including gravel and paved.

An accompanying figure illustrates the effect of traffic on maintenance costs per mile for Minnesota's Waseca County. The roads are grouped by traffic volume and surface type along the bottom of the graph. An increase in traffic does lead to an increase in maintenance costs, especially for gravel roads. This is due to more lost gravel due to wear, and an increased need for blading and smoothing of the road surface.

Note that at a traffic volume of 200 average daily traffic, gravel road maintenance costs increase significantly. This level of ADT offers a possible threshold for when this agency might decide to pave a gravel road.

Adapting the data

You will want to adapt the data from the study to your own roads to create a formula that you can use. The Minnesota report can be used to calculate your own maintenance costs per mile and is available online at www.lrrb.org/pdf/200509.pdf. The report tells users to:

1. Review the historical costs of maintaining paved roads for your agency and, if those costs are not available, review data for one of the four counties analyzed in the report to get an idea of what your costs might be.
2. Compute estimated gravel road maintenance costs per mile for your agency.
3. For a proposed upgrade, develop a cost estimate in the same way a contractor would for any new construction project under consideration.
4. Evaluate this cost estimate to compare the alternatives and make a decision for each roadway segment under question.

By using the information presented in this report, an agency can evaluate its typical maintenance and construction costs, and can identify the annual maintenance costs for a given type of roadway (whether it's paved or unpaved), and the typical construction costs for a variety of surface projects.

Surfacing criteria

The main objective of a second report, published by the South Dakota Department of Transportation, was to create a process comparing maintenance requirements for different surface types. The resulting data can help agencies pick the most economical alternative under a given set of conditions. Surface types include hot-mix asphalt, blotter, gravel, and stabilized gravel roads.

Many of the project elements were similar to the Minnesota project. However, the South Dakota project developed an easy-to-use computerized tool that lets an agency input local costs and treatments to fit their own conditions.

This computerized tool leads the user through a series of steps to:

1. Input information about the road section, including the project limits and the average daily traffic count.
2. Input the actual agency maintenance and construction costs, broken down by surface type.
3. Estimate user costs, which are costs to the people who drive on the roads, and include vehicle operating and crash costs associated with a roadway surface type. These user costs can even be weighted to give them more or less importance in the analysis.

After the initial input variables are submitted, the computer program summarizes total costs for building and maintaining each roadway type.

The evaluator then inputs other non-economic factors that relate to all surface types, including growth rates for an area, housing concentration, dust control needs, mail route locations, truck traffic, and political considerations. The evaluator is allowed to weigh each of the factors in the analysis.

This tool provides output that is easy to generate and understand. Costs can be computed for several alternatives. The program helps the user select appropriate input variables for a typical agency. Results are objective and help make a clear comparison for a variety of roadway surface types.

The computerized tool

Like many agencies, South Dakota is willing to share. Their computerized tool is available for download from the South Dakota Department of Transportation's Web site at: www.state.sd.us/Applications/HR19ResearchProjects/project_reports.asp. Information can be downloaded in three forms:

- Full report: the complete report, with references, data, and research process fully outlined.
- User's guide: a hands-on guide that introduces the macro-driven, Excel-based analytical tool developed to apply low-volume road management methods recommended under the project.
- Technical brief: developed to provide a step-by-step procedure for making road decisions among possible surface materials—hot-mix asphalt, blotter, gravel, and stabilized gravel.

The user's guide outlines all steps required to download the software and populate the required fields with local data.

Making the choice

With the computer tool, the user inputs actual local costs for maintenance and construction activities. He or she also supplements those costs with road-user costs, such as crash data and quality-of-life considerations, as well as other non-economic factors. The computer program, once run, provides ratings for each surface type based on input variables. The user then selects one surfacing alternative over another, based on ratings and local priorities.

The results of both gravel road studies note that maintenance and construction costs vary considerably from one agency to another, and from one season to another. Traffic is a primary factor in deciding to pave or not to pave in many locations.

The Minnesota study found that gravel road maintenance costs per mile appear to increase considerably after roads start carrying over 200 vehicles per day. The South Dakota study found that paved roads are most cost-effective at ADT levels above 150 vehicles per day.

Information from both reports can be used to make locally informed decisions about paving a gravel road or maintaining it as a gravel surface. Thanks to the findings of both projects, local agencies can be better prepared to move forward in developing an efficient and appropriate maintenance and construction program.

Reprinted with permission from the April 2007 issue of Better Roads Magazine.

SCDOT Releases 2008 Edition of the Access and Roadside Management Manual

SCDOT's Access & Roadside Management Standards (ARMS Manual) has been revised, and the revisions will become effective on July 1, 2008. The revisions update many design criteria to current standards and place more emphasis on the need for proper engineering studies to determine the appropriate access design. Major changes and additions include traffic impact study guidelines, the development of a driveway classification system, improved methods to determine driveway spacing and location, and in-depth criteria for the determination of sight distance. SCDOT's Guidelines for School Transportation Design has also been updated and added as a chapter to this manual.

The document is available free of charge in PDF format on the SCDOT website at: http://www.scdot.org/doing/trafficengineering.shtml#accessRoadside.

An errata sheet, which is also available online, has been established and will be updated when corrections are necessary.

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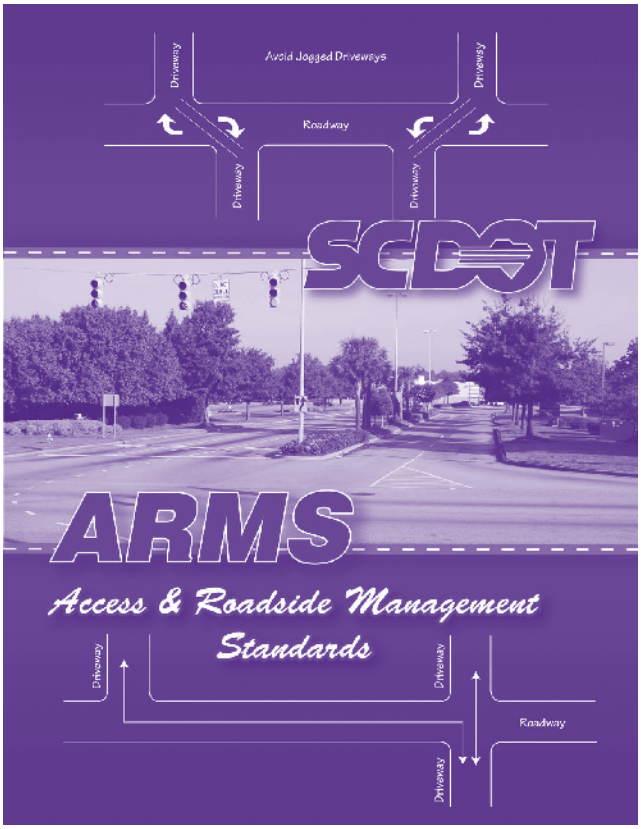

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- More Speeding Fatalities: In 2006, 12,190 drivers involved in fatal crashes were speeding; 57 percent were drivers in rural areas.
- More Impaired Driving Fatalities: Of the passenger vehicle occupant fatalities involving impaired driving crashes (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 an 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.

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.

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 on coming 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.

Emergency Medical Services: NHTSA is helping to develop National Trauma Field Triage Protocols to

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New Safety Study Finds 5 Key Facts and Factors Linked to Deaths of Young Drivers

A study just released by the National Cooperative Highway Research Program (NCHRP) finds that young drivers continue to die at higher rates, than any other age group. The report, entitled "NCHRP 500: A Guide to Reducing Collisions Involving Young Drivers" points to five key facts and contributing factors:

Deadliest Time: Among 16-year old drivers, the risk of a fatal crash is about 3-times higher after 9 p.m. than during the daytime.

Alcohol Factor: Alcohol involved crashes increase from relatively low rates among 16-year old drivers to a peak among drivers aged 20-to-24. Although alcohol-involved crashes remain high among drivers into their mid-30's, impaired driving declines each year as individuals take on more stable jobs, marry and begin to have children.

Lack of Supervision: Drivers 18 and older are more likely to live outside the family home. This results in them driving more and having fewer protective constraints on their time and driving. Their crash rates continue downward due to increasing experience, but their crash numbers increase as a result of greater exposure and an increase in dangerous behaviors of which driving after drinking is perhaps the most obvious example.

Risk Factor: While 15-to-20 year olds represent 8.4 percent of the U.S. population and 6.3 percent of licensed drivers, they account for13.6 percent of the drivers involved in fatal motor vehicle crashes.

Passenger Risk: Young drivers especially 16- and 17-year olds are responsible for a larger number of passenger injuries and fatalities per crash than more experienced drivers. More than one-half of all fatalities occur when passengers younger than 20 are present and there is not an adult in the vehicle.

According to the report, the solutions include increased public and parental awareness, tougher laws and enforcement, graduated driver licensing, and improved young driver training. The report also calls for the elimination of early high school start times, citing studies that indicate young people need to be asleep in the early morning hours. The report concludes that "decreasing young driver crashes will require not only reducing the factors that contribute to crashes for all drivers, but also addressing the inexperience and the social, emotional, and biological development that characterize young drivers."

The NHCRP Report 500 was written by the Transportation Research Board of the National Academies of Sciences as part of a series of implementation guides addressing the emphasis areas of the American Association of State Highway and Transportation Officials (AASHTO) Strategic Highway Safety Plan (http://safety.transportation.org).

The program is supported on a continuous basis by funds from participating members of states of the Association and it receives the full cooperation and support of the Federal Highway Administration, and the U.S. Department of Transportation. If you would like to read the complete report please visit the Transportation Research Board website at http://www.trb.org/news/blurb_detail.asp?id=8493.

Low Cost Treatments For Horizontal Curve Safety Publication Available

Nearly 25 percent of fatal crashes occur at or near a horizontal curve. Hence, addressing the safety problem at horizontal curves is one of the 22 emphasis areas of the Strategic Highway Safety Plan prepared by the AASHTO. Also, crashes at the horizontal curves are a big component of the road departure crash problem, which is one of FHWA's three focus areas. This publication was prepared to provide practical information on low-cost treatments that can be applied at horizontal curves to address identified or potential safety problems. The publication concisely describes the treatment; shows examples; suggests when the treatment might be applicable; provides design features; and where available, provides information on the potential safety effectiveness and cost. The treatments include:

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Worker Visibility Apparel

A greater risk of injury or death for highway workers has resulted from the increase of maintenance and reconstruction of the nation's highways. To help make work zones safer and provide additional safety to everyone on the roadway, FHWA recently finalized its proposed Worker Visibility Rule.

The rule requires that "all workers within the right-of-way of a Federal-aid highway who are exposed to either traffic or to construction equipment within the work areas shall wear high-visibility safety apparel." The rule is effective on November 24, 2008. Workers are defined as those people on foot whose duties place them within the right-of-way of a Federal-aid highway, such as highway construction and maintenance personnel, surveyors, utility crews, responders to incidents, and law enforcement personnel when directing traffic, investigating crashes, and handling road situations.

In addition, mowing crews, gardeners, Adopt-A-Highway volunteers, etc. will also have to wear the high-visibility clothing to be in compliance with the new rule. The only exception will be law enforcement personnel during manhunts, traffic stops, and searches.

High visibility apparel means personal protective safety clothing that is intended to provide conspicuity during both daytime and night-time usage, and that meets the Performance Class 2 or 3 requirements of the ANSI/ ISEA 107-2004 publication entitled "American National Standard for High Visibility Safety Apparel and Headwear." Rule 23 CFR Part 634 in the Code of Federal Regulations was published in response to SAFETEAU-LU and can be accessed at: http://a257.g.akamaitech.net/7/257/2422/01jan20061800/edocket.access.gpo.gov/2006/E6-19910.htm.

The selection of CLASS 1, 2 or 3 apparel is based on proximity to traffic, the speed of traffic expected in a work area and whether attention can be paid to traffic while working.

CLASS 1 Apparel

This apparel is for workers exposed to traffic traveling less than 25 MPH and, therefore, not acceptable for workers on or near Federal Aid Highways. The main difference between CLASS 1 and 2 is the amount of fluorescent background material and retroreflective material used on the clothing. Typical workers required to wear CLASS 1 include parking lot attendants, warehouse workers, shopping cart retrievers, and sidewalk maintenance personnel.

CLASS 2 Apparel

The most common garments are shirts, jackets, or sleeveless vests. This apparel provides 360 degrees of torso visibility with horizontal and vertical retroreflective stripes. Typical occupations for workers who must wear CLASS 2 are: forestry operations, roadway construction, trash collection, high-volume parking, emergency response, and law enforcement. Some "safety" vests look similar to CLASS 2 so you must inspect the tag to be sure it complies to avoid violations.

CLASS 3 Apparel

CLASS 3 covers more of your body than CLASS 2. It is for workers who are constantly exposed to high-speed traffic and who cannot pay attention to approaching traffic. If you are not sure which class to wear, choose CLASS 3 to be safe. Workers who must wear this type include roadway construction personnel, utility workers, survey crews, and emergency responders.

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- Basic traffic signs and markings found in the MUTCD
- Enhanced traffic control devices
- Additional traffic control devices not found in the MUTCD
- Rumble strips
- Minor roadway improvements
- Innovative and experimental treatments

The publication concludes with a description of maintenance activities that should be conducted to keep the treatments effective.

Copies are now available (in large quantities) from the FHWA Report Center, online, and for download in PDF: http://safety.fhwa.dot.gov/roadway_dept/pubs/sa07002/index.htm. Phone: 301-577-0906 or Email: Report.Center@fhwa.dot.gov.

Americans Driving At Historic Lows

Eleven Billion Fewer Vehicle Miles Traveled in March 2008 Over Previous March

WASHINGTON - Americans drove less in March 2008, continuing a trend that began last November, according to estimates released June 3, 2008 from the Federal Highway Administration.

"That Americans are driving less underscores the challenges facing the Highway Trust Fund and its reliance on the federal gasoline excise tax," said Acting Federal Highway Administrator Jim Ray.

The FHWA's "Traffic Volume Trends" report, produced monthly since 1942, shows that estimated vehicle miles traveled (VMT) on all U.S. public roads for March 2008 fell 4.3 percent as compared with March 2007 travel. This is the first time estimated March travel on public roads fell since 1979. At 11 billion miles less in March 2008 than in the previous March, this is the sharpest yearly drop for any month in FHWA history.

Though February 2008 showed a modest 1 billion mile increase over February 2007, cumulative VMT has fallen by 17.3 billion miles since November 2006. Total VMT in the United States for 2006, the most recent year for which such data are available, topped 3 trillion miles. Data shows that Americans drove 3,033,753,000,000 miles in 2006.

Additionally, the U.S. Department of Transportation estimated that greenhouse gas emissions fell by an estimated 9 million metric tons for the first quarter of 2008.

The estimated data show that VMT on all U.S. public roads have dropped since 2006. The FHWA's Traffic Monitoring Analysis System (TMAS) computes VMT for all types of motor vehicles (motorcycles, cars, buses and trucks) on the nation's public roads. These data are collected through over 4,000 automatic traffic recorders operated round-the-clock by state highway agencies. More comprehensive data are published in the FHWA's "Highway Statistics" at the end of each year.

To review the FHWA's "Traffic Volume Trends" reports, visit http://www.fhwa.dot.gov/ohim/tvtw/tvtpage.htm. For "Highway Statistics 2006," visit http://www.fhwa.dot.gov/policy/ohim/hs06/index.htm.

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guide EMS providers in expediting transport of seriously injured patients to trauma centers. NHTSA's National EMS Information System (NEMSIS) will aid in evaluation and improvement of pre-hospital trauma and EMS care. NHTSA has developed a Rural EMS Medical Director's Course, available online, to assist rural physicians in improving pre-hospital emergency medical care.

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 should and centerline rumble strips, a specific, low-cost infrastructure solution that is particularly relevant for rural roads.

Sometimes RED Means Go

Motorcyclists in a growing number of states are being allowed to go through red lights when sensors aren't able to detect they are there.

In May, South Carolina became the seventh state to give motorcyclists license to proceed with caution after stopping when the device that causes the light to change from red to green doesn't activate, according to Imre Szauter, government affairs manager for the American Motorcyclist Association.

North Carolina passed a similar law in 2007. Wisconsin (2006), Idaho (2006) Arkansas (2005), Tennessee (2003) and Minnesota (2002), all have passed laws the past six years, Szauter said. Bills have been introduced for the same purpose in Georgia, Missouri and Oklahoma, according to the National Conference of State Legislatures and the legislative websites for those states.

The Federal Highway Administration says such laws raise safety concerns, but biker groups that have lobbied for the change say they are common sense.

"We want to emphasize that the riders do this with safety and caution in mind," Szauter said. "If they truly are trapped at a light, this gives them an opportunity to safely proceed through that signal, because otherwise they don't really have much of a choice."

Doug Hecox, a spokesman for the Federal Highway Administration, said the states should try to find a technical solution to the problem.

"We don't necessarily think that empowering motorists to make up their own rules of the road is the safest or best approach," he said.

The traffic lights in question are controlled by devices buried under the road that operate similar to metal detectors, according to Hecox. Their sensitivity can be set to detect motorcycles, but the proper balance is difficult to adjust, he said.

California has chosen a technological solution. A law adopted last year requires that when new traffic-activated signals are installed, they be capable of detecting motorcycles and bicycles.

Motorcyclist Splatt Ratt of Palm Springs, California, a member of the board of directors of a motorcyclists advocacy group called American Bikers Aimed Toward Education, said that's not good enough. Replacing all the ineffective traffic-detection devices could take years, he said.

"The gist of the whole problem is I live in the stop-light capital of the world," he said.

Reb Richardson, a motorcyclist from Sumter, South Carolina, said he pushed his state's Legislature for three years to get the bill passed that Republican Governor Mark Sanford signed last month. Richardson's efforts grew out of frustration over a traffic light at the intersection near his home.

"That light would never change," he said. "There's just not enough metal in motorcycles to detect them."

Some motorcyclists try to deal with the problem by motioning for a car behind them to pull forward to trip the signal, Richardson said. This puts the biker in danger, forcing the motorcyclist to move too far into the intersection, he said.

Scott Kauffman of Portland, Oregon, says he has a solution. He has developed a magnetic device he calls the Green Light Trigger that straps onto the motorcycle and causes the traffic light to think a car is there, he said.

He's not worried about the changes in state law putting his company, Green Light, out of business. It's still better than running red lights, he said.

"You may not need it legally, but they need it from a safety standpoint," he said.

SPEED BUMP **Dave Coverly**

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