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Are We There Yet?

South Carolina Transportation Technology Transfer Service

In This Issue...

- 1** Washboarding
- 4** Hot Topic—Relationship Between Speed and Crash Risk
- 5** Road Crashes Reduced 42% in Mendocino County, CA—Unbelievable, But True!
- 6** New Staff Member—Shaun Gaines
- 7** Pavement Preservation Resources Offer “How-To” Guidance
- 8** Safety Zone
- 9** Are Traffic Signals Warranted in All School Zones?
- 10** Aiken Public Works Director Receives Prestigious National Award
- 10** Count on Concrete—Save the Date
- 11** Publications and Videos

Washboarding

One of the most aggravating gravel maintenance problems plaguing grader operators, managers and elected officials is corrugation. Often called “washboarding”—because driving on a corrugated gravel surface is much like driving over a giant washboard—this nuisance elicits more complaints from the public than any other gravel maintenance problem. And, washboarding doesn’t just make for an uncomfortable ride, washboarding can be a safety problem: even moderate washboarding can reduce vehicle control.

Causes & Cures of Washboarding

Driving Habits

Hard acceleration and hard braking can lead to washboarding. When vehicle tires lose a firm grip on the road and spin or skid, a slight amount of gravel is displaced. With repetition, the gravel will align into a washboard pattern. Light vehicles with small wheels and light suspensions are a bigger culprit than heavy trucks, which tend to grip the road better. Washboarding usually appears where you would expect repeated hard acceleration or braking, at intersections, sharp curves, business entrances, and driveways. Don’t expect the public to stop accelerating hard, driving fast or applying their brakes firmly: driving habits is one cause of washboarding that we have no control over.

Lack of Moisture

Prolonged dry weather can cause washboarding, even with relatively low

traffic. In high traffic areas, just a few days without rain can lead to washboarding. Since hauling water is generally cost prohibitive and counter to water conservation efforts, we have no control over moisture in the gravel.

Poor Quality Gravel

Washboarding will almost certainly develop if the surface gravel has poor gradation,

(cont. on page 2)



This type of corrugation, “washboarding,” is caused by lack of moisture, hard acceleration, aggressive braking, and poor quality gravel



This type of washboarding appears at an angle across the roadway with ridges and depressions two to three feet apart. It is caused by excess grader speed.

The LTAP Center for South Carolina

(cont. from page 1)

little or no binding characteristic, and a low percentage of fractured stone. Here, we have complete control: we can ensure that any new material we place has good gradation with adequate fines, and we can work existing material to perform to its potential. Good gravel is our cure for washboarding.

What Is Good Gravel?

Surface gravel should be a blend of stone, sand and fines that will compact into a dense, tight mass with an almost impervious surface. Proper gradation is paramount. Gravel with too few stones will not have strength in wet weather. Gravel with excessive stones will be hard to compact, and the stones will “float” in dry weather, piling up between the wheel tracks and along the shoulders. Gravel with too few fines will not allow the gravel to form a crust. Gravel with excess fines will be slick in wet weather.

Generally, the maximum size stone should be $\frac{3}{4}$ ". Crushed gravel with a higher percentage of fractured stones will have better “aggregate interlock” and will stay in place better than rock with a naturally rounded shape, reducing washboarding and yielding higher strength.

The proper percentage and quality of fine materials, those that pass

the #200 sieve, will act as a binder, holding the larger aggregate in place and increasing the cohesiveness of the gravel. There are natural binders, such as clay, and commercial binders. When exposed to moisture, these materials will cling together tightly, helping the surface resist washboarding.

Beware, some fines fall into the silt category and will not yield the cohesiveness needed. While you may be able to compact the material into a dense mass, it will loosen more quickly under traffic and will cause more dust in dry weather. The only way to determine which type of fines you have is by laboratory testing the Plasticity Index (PI) of the material.

While sampling and testing the gravel is the only sure way to determine the quality, you can perform some basic field tests. To test gravel with moisture for binding characteristic, squeeze material into your fist. The material should form a ball. To test for the presence of fines, pick up a hand full of gravel, then drop it back down. You should see fine material remaining on your hand.

How to Obtain Good Gravel

Obtaining good gravel in the field can be a real challenge, but it’s worth the extra effort, because this is where the

fight against washboarding begins. Start by establishing good specifications. Close control of materials used in the base, asphalt and concrete of our major construction projects is expected, however little attention is normally given to surface material specifications for “plain old gravel roads.” Increase your knowledge of materials, then specify exactly what you want. Even if your local pits and quarries do not have a good natural blend of materials, the blend can often be improved simply by working the pit differently, or by hauling in and blending materials such as clay or stone at the plant. Communicate your needs with your supplier.

Another option for improving the quality of the gravel is to incorporate reclaimed asphalt. With a 50/50 blend of recycled asphalt and virgin gravel, the asphalt will act as a binder and the surface will resist washboarding. The asphalt/gravel blend can still be worked with a grader. For best results, this blend should be placed to a minimum compacted depth of three inches.

Do not overemphasize an inexpensive initial cost for material. You’ll spend more to maintain and replace it over the years and receive more complaints from the public. Quality material lasts longer, requires less maintenance, and generates fewer complaints. Keep in mind, transport is often a significant portion of the total cost of the gravel placed on the road. Spending more to increase the quality of the gravel may cost less than you think.

If the cost of the highest quality material remains prohibitive, consider using the best material available only on the trouble spots. Use regular material on the rest of the road.

Maintenance Techniques to Control Washboarding

Simply blading over washboards with a motorgrader skimming off the ridges and filling the depressions is almost useless. The best way to eliminate



Another washboard-prone area is at the transition from paved to gravel sections as shown in this photo.

washboarding is to cut all of the material loose to a depth of one inch or more below the bottom of the washboard area, then work the material to mix in the fines brought up from below, finally reworking the material back to the proper shape and crown.

Use of a commercially available attachment of rotating scarifying teeth attached to the moldboard of the grader blade produces excellent results, mixing the fines back into the surface gravel. A replaceable bit-type cutting edge on a front-mounted dozer blade can also be used to cut material loose and mix it. Use of a conventional scarifier works too, but only if you can avoid going too deep, bringing up dirt and large rocks from the subgrade and contaminating the gravel.

Another method to improve the gradation of material is to pull material in from the shoulder and mix it with the loose gravel on the surface. This works best in the Spring before too much vegetation grows on the shoulder and moisture is still present. This material is generally not the best binder, but it does have some benefit in restoring fines to the gravel.

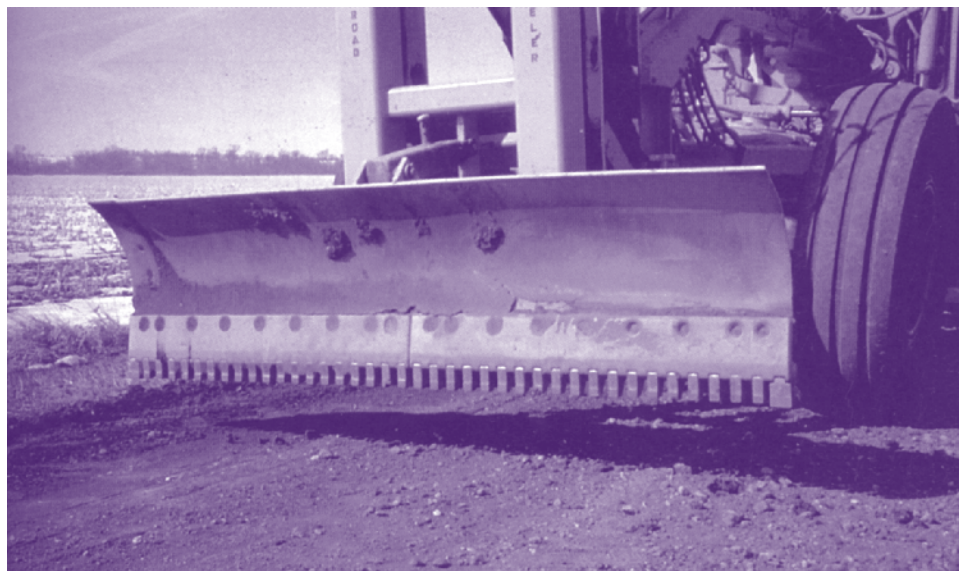
In some locations, windrows will be made to create roadside dikes for the Winter season. Be aware that the fine materials from the gravel will flow away with the water. Simply blading the windrows back into the roadway in the Spring may not be sufficient.

When placing new material on a washboarded area, always cut and rework the area before adding the new material. Otherwise, the washboard pattern in the original surface will reflect up to the new surface and you'll have the same problem you started with sometimes in as little as just a few weeks.

Treating gravel with calcium or magnesium chloride is also an option. These commercially available products are not binders, but aid in keeping gravel in place by drawing moisture



It is good practice to loosen, mix, and reshape gravel in a washboard prone area while it is moist.



An effective tool for dealing with washboard areas is the front dozer equipped with barbed bits.

from the air. The key to success with these products is using them on gravel that already has proper gradation and good natural binding characteristics. The chlorides will work to keep the surface slightly damp and the gravel tightly bound.

Blading should never be done without good moisture in the material: material should be moist, but not saturated. It may pay to quickly run to work problem areas after a good rain, then resume normal blading. You may be able to reduce blading on outlying, low volume roads to just twice a year: in the Spring after the last rain, and in the Fall after the first rain.

Finally, a note to dispel a common myth: motorgraders do not cause washboarding. While it is true that graders can cut distortions into a gravel surface, this distortion will never look like washboarding.

When an operator runs a grader too fast, the machine can begin to “lope” or bounce. The resulting humps and dips will be farther apart and cut at an angle across the roadway, at the same angle as the moldboard during the blading. Motorgraders help you control washboarding, they don’t cause it.

Control Washboarding

High quality materials and proper maintenance may not eliminate washboarding completely, but they will certainly reduce it. ♡

Reprinted with permission from Tech Transfer, Winter 2004, the quarterly newsletter of the California LTAP; adapted from “Dealing with Washboarding,” South Dakota LTAP Special Bulletin #29, by Ken Skorseth. Photos provided by Ken Skorseth, South Dakota LTAP.

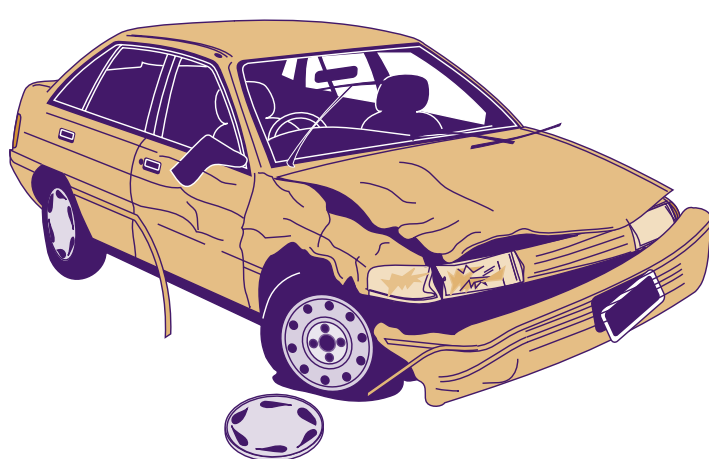
Hot Topic – Relationship Between Speed and Crash Risk

By Jennifer Boteler, WSDOT Librarian
Reprinted from WST2 Winter 2004

In 1987 states were allowed to raise speed limits up to 65 mph on certain Interstate roads, and in 1995 the National Maximum Speed Limit was repealed. Since then there have been a number of studies and reports on the effects of increased speed limits on accident rates. Judging by the latest transportation literature, this subject is still a hot topic under investigation. The following research has recently been released regarding vehicle speed and road safety.

The effect of increasing rural interstate speed limits in the United States. T.L. Patterson, W.L. Firth, L.J. Povey, and M.D. Keall. *Traffic Injury Prevention* Vol. 3, No. 4, 2002. pp. 316-20

Within a year of the repeal of the National Maximum Speed Limit in the United States, 23 states had raised their rural interstate speed limits to 70 or 75 mph. The effect on rural interstate fatalities between 1992 and 1999 was examined by modeling between the old and the new speed limit. Fatalities within states that raised their speed limits to 75 mph and 70 mph were 38% and 35%, respectively, higher than expected, compared to states that did not change their speed limits. Furthermore, the states that raised their speed limits to 75 mph had a higher rural interstate fatality rate before the speed limit was changed than the other groups of states. (Abstract from TRIS, <http://199.79.179.82/sundev/search.cfm>).



Effect of repeal of the national maximum speed limit law on occurrence of crashes, injury crashes, and fatal crashes on Utah highways. D.D. Vernon, L.J. Cook, K.J. Peterson, and J. Michael Dean. *Accident Analysis & Prevention*. Vol. 36, Iss. 2, pp. 135-304, March 2004.

Speed limits were increased in Utah and other states after repeal of the national maximum speed limit law (NMSL) in 1995. This study analyzed effects of the increased speed limit on Utah highways on crash rates, including fatality and injury crash rates. Annual (1992–1999) rates for the following highway categories were calculated: urban Interstate segments (current speed limit 60–65 miles per hour (mph)); rural Interstate segments (current speed limit 70–75 mph); 55 mph rural non-Interstate highway segments; and high-speed non-Interstate highways (current speed limit 60–65 mph). Data were analyzed using autoregressive integrative moving average intervention time series analysis techniques. There were significant increases in total crash rates on urban (60–65 mph) Interstate segments (however this was confounded by extensive ongoing highway construction on these highways), and in fatal crash rates on high-speed (60–65 mph) rural non-Interstate segments. The following variables were unaffected: total, fatality, and injury crash rates on rural Interstate segments; fatality and injury crash rates on urban Interstate segments; total and injury crash rates on high-speed non-Interstate segments. These results show an adverse effect on crash occurrence for subsets of crash types and highways, but do not show a major overall effect of NMSL repeal and increased speed limit on crash occurrence on Utah highways. (Abstract from Elsevier ScienceDirect, <http://www.sciencedirect.com>)

Faster Travel and the Price We Pay. Status Report, Vol. 38, No. 10, p. 1, Nov. 22, 2003. Insurance Institute For Highway Safety. <http://www.hwysafety.org/srpdfs/sr3810.pdf>

For years, Institute [for Highway Safety] and other research has [sic] quantified the price in lives we pay to get from here to there a little bit faster. The most recent estimate is that higher speed limits increase deaths on rural interstates by about 35 %. Yet motorists on both rural and urban roads are going faster and faster, encouraged by automakers who build ever more powerful cars and touting their speed capabilities in ad after ad. (From the front cover of Status Report)

The impact of speed on road safety. J. Barker. Transport Research Laboratory (TRL Limited, Crowthorne, Berkshire Co., Eng, UK) Staff Paper PA/SE/3956/03. 3p. 2003.

The latest research pertaining to auto speed and road safety is reviewed. Speeders are defined as drivers who

(cont. on page 5)

Road Crashes Reduced 42% in Mendocino County, CA - Unbelievable, But True!

By Gib Peaslee, Coordinator, NLTAPA
Product Demonstration Showcase
Program

Mendocino County lies on the coast of California, about one hundred miles north of San Francisco. Mendocino County Department of Transportation (MCDOT) is responsible for just over one thousand centerline miles of roadway and serves a population of 87,000 people inhabiting an area of 3,510 square miles. By implementing a simple, yet thoughtful program they have achieved a 42 % reduction in low volume road crashes.

While this figure may appear to be beyond the realm of believability to many safety professionals, let's stretch plausibility even further by mentioning this program has been delivering this benefit for more than 10 years; and, the program cost is within every county's reach, including even the most sparsely populated farm-to-market county, parish, or township.

Learn how they did it

You and your road safety management team are invited to experience the entire MCDOT process start to finish at the Mendocino County Road System Traffic Safety Review (RSTSR) Showcase in Ukiah, CA, on September 28-29, 2004.

At this Showcase, MCDOT staff will share every detail including all the

start-up, roadway selection, field review, and deficiency correction processes as well as their subsequent treatment evaluation, treatment selection methodology and cost-benefit measurement process details.

An integral part of this Showcase experience will be guided visits to previously improved field sites. Each field site will be clearly defined showing the previous condition factors and the corrective measure implemented. Participants, as a group, will review and evaluate prior conditions and the applied corrective action. Upon returning to the Showcase auditorium, each team will share reports and their proposed corrective actions, and we will all discuss the potential solutions.

This Showcase is committed to provide all the information and post-showcase support agency personnel will need in order to return home and immediately begin implementing an RSTSR program. To meet that commitment, these key additional support items will be included:

1. A post-Showcase support group will be available to all participating agency teams for "on call" assistance throughout their entire implementation process.
 2. An easy to use Sign Management System (SMS) software package, developed by the New Hampshire
- (cont. on page 6)

Travel Stipend Program

Travel Stipend Program (TSP) scholarships are available for two rural agency teams per state or TTAP. TSPs will cover air travel, overnight accommodations and motor coach transportation fees directly related to this Showcase. Priority will be given to agencies meeting the following criteria:

1. Serving populations under 50,000.
2. Have extensive low volume road miles or high crash rates on low volume roads.
3. Have a restricted travel policy.

Upon registering, qualifying agencies will be provided further travel scholarship program details. For more information on the Travel Stipend Program contact Renee Curtis at the Florida LTAP Center, 352-392-2371 ext. 233, email: pdshowcase@ce.ufl.edu.

Showcase registration fees are not included in the Travel Stipend Program

(cont. from page 4)

drive above the mean speed of all drivers for a road as well as those who exceed the speed limit or drive at very high absolute speeds. Speeders are more likely to be involved in accidents with the risk rising sharply for driving at high speeds. The speeder profile is likely to be young, male drivers who drive high mileages on business and have a tendency to violate traffic regulations. Cross-sectional and before-after road based studies are described. For each one-mile per hour reduction

in mean vehicle speed, accident reductions of between 2% and 9% can be expected. Targeting the problems of the fastest drivers is likely to have the greatest effect in reducing accidents. (Abstract from TRIS <http://199.79.179.82/sundev/search.cfm>)

For help in obtaining full text of any of these publications or for a more comprehensive listing of publications on this topic, contact your local public library or the WSDOT Library at (360) 705-7751 or botelej@wsdot.wa.gov.

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LTAP Center, will be demonstrated and distributed at no cost to interested participants. Post-showcase user support is available through the New Hampshire LTAP Center.

3. An Asset Management software package, developed by the Utah LTAP Center, will be demonstrated and distributed to interested agency participants. Post-showcase user support is available through the Utah LTAP Center.
4. Michigan LTAP will explain how local agencies in Michigan banded together to fund and develop a Crash Analysis and Reporting System that is integrated with their local agency Road Surface, Sign, Guardrail, and Pavement Marking management systems.
5. A Grant Resource Specialist will be available during the Showcase to discuss potential grant sources such as HES Sign Replacement Programs and others. Each participating agency team will be able to schedule a one-on-one meeting with this specialist.
6. A Travel Stipend Program is available for rural agencies with

populations under 50,000 – see page 5.

There are no excuses, now every agency, large or small, has an equal opportunity to participate in this learning experience and have professional support all through their own RSTSR program implementation process.

You should attend if...

- you are responsible for a large number of low volume roadway miles
- you are responsible for signs and markings of your roadways
- you think safety is important
- you are a public official concerned about roadway safety.

Registration Information

The Showcase will convene at the Mendocino College in Ukiah, CA. The registration fee is \$125 per person for the two-day Showcase. This includes lunch during the Showcase, a buffet dinner Tuesday night—perfect for renewing or establishing relationships—a complete manual containing illustrations and text of all presentations, and

MCDOT sample final report tables. Registration fees are not refundable but substitutions are welcome. AAA Travel is available (800-881-6707 ext. 2234) to assist with airline and hotel accommodations for this Showcase. Area location maps for Ukiah, CA, will be provided upon registration. ♡

To register, or for more details, please visit www.pdshowcase.org or call Chris Ritch at the Florida LTAP Center, 352-392-2371 ext. 223, email: chris@ce.ufl.edu, or Daiana Mathis at the California LTAP Center, 510-231-5672, email: daianam@berkeley.edu.

We tip our hats to Stephen H. Ford, RCE, with MCDOT for developing and setting this program in motion and to Eugene Calvert, P.E., former MCDOT Director, for guiding the development of the TRB award winning paper calling national attention to this program.

A heartfelt thank you is due the MCDOT management team and the Mendocino County Board of Supervisors for their willingness to share their valuable public safety program with the rest of the nation.



New Staff Member

We are pleased to introduce you to Shaun Gaines. Shaun joined us in February after the Coast Guard informed us that Debbie Lipscomb, our Workshop Coordinator, would remain on active duty for another year. Shaun's first day on the job was traveling to Columbia and Charleston to facilitate some training classes for the SCDOT, so many of you have already had the opportunity to meet him.

If you would like to register for a class, Shaun can be reached at 864-656-1456 or by e-mail at jgaines@clemson.edu

Take time to introduce yourself to Shaun when you see him at a workshop in your area. ♡

Pavement Preservation Resources Offer “How-To” Guidance

Learn more about pavement preservation practices that are working nationwide by consulting the many new resources, ranging from guidance checklists to CDs, available from the Federal Highway Administration (FHWA).

Two new CDs produced by FHWA and the Foundation for Pavement Preservation (FP2) look at pavement preservation in action across the country. The first CD, *Pavement Preservation 2: State of the Practice*, contains policies, guidance, and technical information from California, Delaware, Michigan, Minnesota, Montana, North Carolina, Ohio, and South Dakota. The CD provides a range of information, from guidelines for statewide preservation programs to examples of innovative funding approaches. Also included are “how-to” technical manuals and details on training courses, videos, fact sheets, and other useful resources.

National Pavement Preservation Forum II: Investing in the Future (Publication No. FHWA-IF-03-019), meanwhile, includes papers and presentations from the 2001 Forum hosted by the California Department of Transportation and FP2 in San Diego, California. The CD covers such topics as introducing new pavement preservation products and techniques, establishing partnerships, integrating pavement preservation into pavement management systems, and performing education and outreach.

For step-by-step guidance on the use of innovative pavement preventive maintenance processes, turn to FHWA’s and FP2’s series of pavement preservation checklists. Topics in the series to date are:

- ▶ Crack Seal Application
(Publication No. FHWA-IF-02-005)
- ▶ Chip Seal Application
(Publication No. FHWA-IF-02-046)
- ▶ Thin Hot-Mix Asphalt Overlay
(Publication No. FHWA-IF-02-049)
- ▶ Fog Seal Application
(Publication No. FHWA-IF-03-001)
- ▶ Microsurfacing Application
(Publication No. FHWA-IF-03-002)
- ▶ Joint Sealing of Portland Cement Concrete Pavements
(Publication No. FHWA-IF-03-003)



National Pavement Preservation Forum II

Investing in the Future

Department of Transportation
Federal Highway Administration



Pavement Preservation 2 State of the Practice

May 2003



The checklists take users through such steps as project review, material checks, surface preparation, equipment inspections, weather requirements, and common problems and solutions.

For information on the scope of pavement preservation activities underway in States from California to Michigan to North Carolina, consult FHWA’s Pavement Preservation Compendium (Publication No. FHWA-IF-03-21), which presents articles, papers, and other reference material on accomplishments to date and future needs. The Compendium also highlights the importance of taking research on innovative and effective system preservation technologies to a higher level. To date, research has lagged behind the demand for knowledge.

To obtain copies of the CDs, checklists, or Compendium, contact Steve Mueller in FHWA’s Office of Asset Management, 202-366-1557 (email: steve.mueller@fhwa.dot.gov), the National Center for Pavement Preservation at 517-432-8220 (email: hahnp@egr.msu.edu), or your local FHWA Division Office. For additional information on pavement preservation, visit the Web sites listed in the shaded area below.

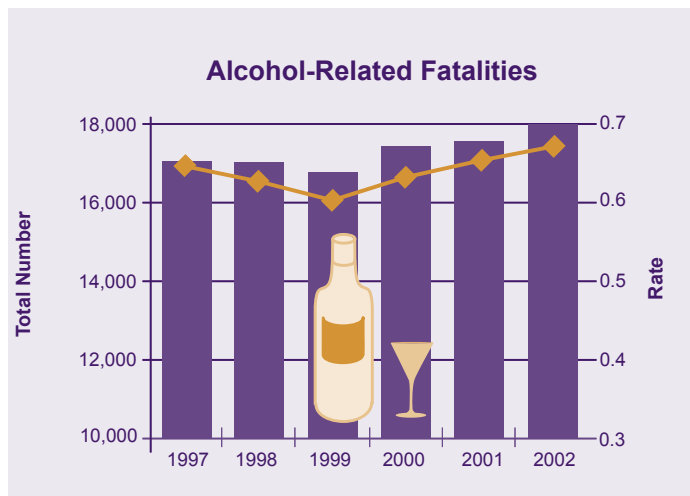
Pavement Preservation Online Resources

FHWA—www.fhwa.dot.gov/preservation
Foundation for Pavement Preservation—www.fp2.org
National Center for Pavement Preservation—www.pavementpreservation.org

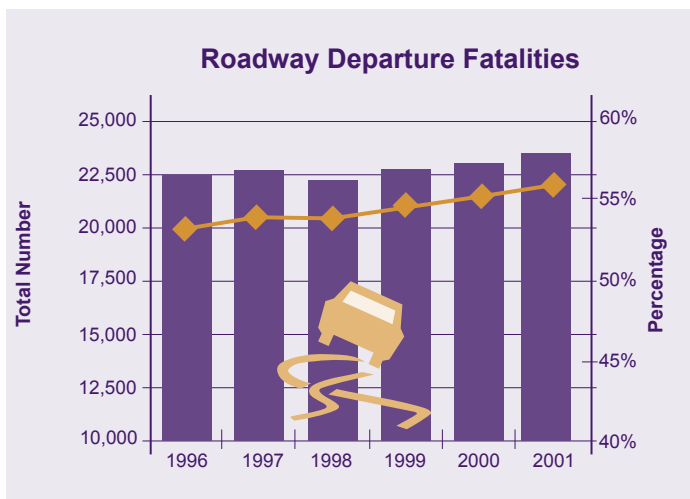
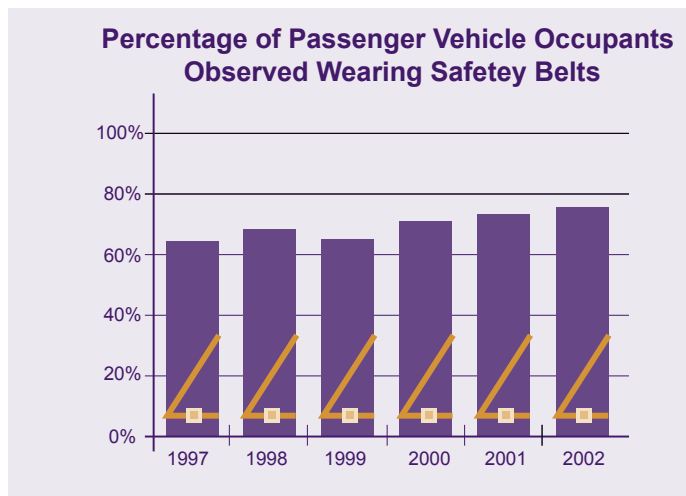
Safety Zone



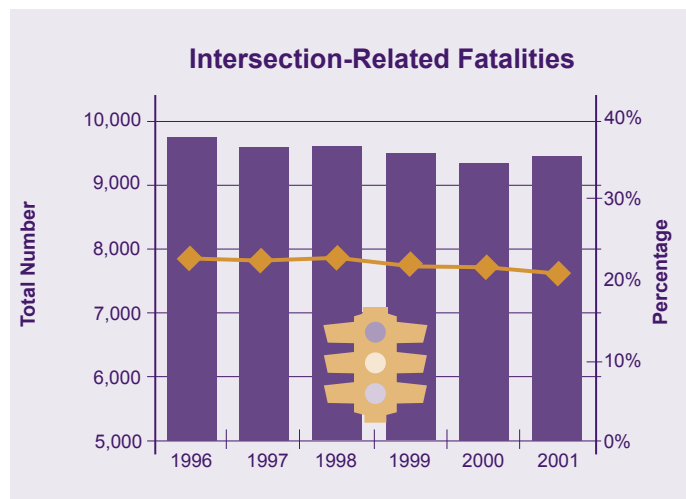
Recent Highway Safety Data: Traffic Related Fatalities and Injuries



Fatalities in Alcohol Related Crashes
 Fatality Rate per 100M VMT



Roadway Departure Fatalities
 Percent of Total Fatalities



Intersection Fatalities
 Percent of Total Fatalities

Data sources for the graphs shown:

Fatality data: Fatality Analysis Reporting System (FARS), 1996-2000 File, 2001 Annual Report File, 2002 Early Assessment File

Injury data: National Automotive Sampling System (NASS) General Estimates System (GES) 1996-2001. 2002 Early Assessment File

Are Traffic Signals Warranted In All School Zones?

Indiana Study Verifies Industry Standards

Tommy E. Nantung

From TR News, March-April 2004, pp. 36-37. Copyright, Transportation Research Board, National Research Council, Washington, D.C. Reprinted with permission.

Transportation agencies and the public are interested in improving safety in school zones but sometimes do not agree on the best approach.

Problem

Crashes at intersections adjacent to schools attract press coverage and provoke community discussion. After a significant crash, parents, local groups, and city officials often request the installation of a traffic signal to improve safety at the intersection. The vigor of the request increases if the crash involves personal injuries, particularly to children. After receiving a request to install a traffic signal, Indiana Department of Transportation (DOT) performs an engineering study following guidelines in the Manual on Uniform Traffic Control Devices (MUTCD). Often the study indicates that installation of a traffic signal is not warranted, and the request is denied. The denials then generate additional press coverage and requests for explanations. The requests are difficult to address because of limited data that quantitatively document the effect of signals on crash rates.

Solution

Indiana DOT contracted with Purdue University through the state-university Joint Transportation Research Program to analyze crash data before and after the installation of traffic signals that were marginally warranted; that is, at intersections that barely met the MUTCD warrants or qualifying criteria for traffic signals. Working

with Indiana DOT, a research team led by Darcy M. Bullock, a professor at the Purdue University School of Engineering, identified 19 traffic signals installed between 1994 and 1996; 7 of the signals were near schools.

Crash data from 1991 to 1999 were collected and categorized by type, severity, and proximity to the intersection. The data were adjusted to account for changes in average daily traffic and the number of years of available before-and-after data. Table 1 summarizes the statistical comparison of the before-and after-crash rates. Pedestrian crashes are rare and therefore difficult to analyze statistically. Because no pedestrian crashes were recorded at the 19 intersections before or after traffic signals were installed, the study did not include that category.

The results reconfirmed the appropriateness of the MUTCD warrants. The researchers therefore recommended that Indiana DOT should not install traffic signals if the MUTCD warrants were not met or were marginal.



The report presents alternatives to traffic signals that other agencies have found useful in improving safety near schools:

- Place adult crossing guards at wide streets. The guards should wear brighter vests and uniforms and should undergo special training;
- Enforce speed limits more strictly near schools. Extend zero tolerance for speeding in 15-mph zones, set speed limits of 5 mph for other zones, and raise fines or add points for school zone citations;
- Paint SCHOOL on the pavement of high-speed approaches;
- Establish buffers and wider sidewalks with larger waiting areas for students and Stand Back lines to restrain students;
- Increase safety training for students; and
- Develop safest route to school plans that prevent the location of new elementary schools on major

(cont. on page 10)

Table 1

Data Set	Crash categories with observed reductions	Crash categories with observed increases
7 signals adjacent to schools	None	Total Number Property Damage Only Rear End Head On Run off Road Left Turn
19 signals (including those at schools)	Right Angle Right Turn	Total Number Personal Injury Rear End Head On Run off Road Left Turn Other

Aiken Public Works Director Receives Prestigious National Award

The American Public Works Association has named Aiken Department of Public Works Director Larry Morris to its list of the Top 10 Public Works Leaders in America for 2004.

This is among the most prestigious, and highly contested, awards given annually by the APWA, open to public works professionals throughout North America. The award can go to public works professionals in private industry, federal, state, regional, county or municipal governments and other categories.

In a letter informing Morris of his selection, APWA Executive Director Peter B. King wrote, "Your name is now counted among an elite group of public works professionals who have been recognized for excellence, and

are the 'best and brightest' leaders in the profession."

Aiken City Manager Roger LeDuc said, "We applaud this recognition for Larry. He has distinguished himself among the literally hundreds of thousands of public works professionals who are eligible for this award across the continent, and he is a tremendous asset for our city."

Remarkably, during his previous tenure as Aiken Public Works Director before promotion to City Manager, LeDuc was one of only two other South Carolinians to have also won this award in the 50-year history of the association.

On receiving the recognition from his peers across the U.S., Canada and Mexico, Morris said he is both amazed



and humbled. "This is a testament to the tremendous staff of the Aiken Public Works Department, the political and professional leadership of the City of Aiken, and to the people of Aiken who demand and appreciate the highest standards," Morris said. ♦

(cont. from page 9)

streets, and that use arterial streets as boundaries for school populations.

Benefits

Indiana DOT now can cite the research results to demonstrate that a traffic signal is not always the best way to improve safety. Other treatments can be effective at lower costs. For example, as a result of this study, Indiana DOT has justification for not installing 40 requested traffic signals. Since an average signal costs \$68,000, the total savings amounts to \$2,720,000, not including the savings in power, maintenance, and operations costs. ♦

For further information contact Tommy Nantung, Research Division, Indiana Department of Transportation, 1205 Montgomery Street, P.O. Box 2279, West Lafayette, IN 47906 (telephone 765-463-1521, Ext. 248, e-mail tnantung@indot.state.in.us).

"Count on Concrete" set for November 4th

The Second Annual "Count on Concrete Conference" will be held on November 4th at the Columbia Conference Center, 169 Laurelhurst Ave, Columbia, SC. This conference is co-sponsored by the Southeast Cement Association, the American Concrete Pavement Association, and T³S. Last year's conference was a great success, and we anticipate an even better turnout this year. There will be topics of interest to both local and state transportation officials, as well as for transportation design and construction firms. Place November 4th on your calendar now and look for more information coming soon. We look forward to seeing you there! ♦

November						
Sun	Mon	Tues	Wed	Thur	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Information Request and Address Change Form

To order any of the publications, videos, or other materials listed in this or other issues of *Are We There Yet?*, complete this form and mail it or fax it to Sandi Priddy at the address or phone number shown below. You can also order videos and publications online at <http://www.ces.clemson.edu/t3s>.

The publications in this issue 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

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Publications

- ☐ *A Review of Pedestrian Safety Research in the US and Abroad—FHWA-RD-03-042.*
- ☐ *Full Road Closure for Work Zone Operations, A Cross-Cutting Study—FHWA-RD-03-042.* (also available on line at <http://www.fhwa.dot.gov/workzones>).
- ☐ *Accessible Sidewalks and Street Crossings—An informational Guide—FHWA-SA-03-019.*
- ☐ *Asphalt Pavement Warranties Technology and Practice in Europe—FHWA-PL-04-002 HPIP.*
- ☐ *Traffic Control Guide Book for Mobile Operations at Night, Guidelines for Construction, Maintenance, and Utility Operations—FHWA-SA-03-026.*
- ☐ *Integrating Tourism and Recreation Travel with Transportation Planning and Project Delivery, NCHRP Synthesis 329, Transportation Research Board (available in pdf format at www.trb.org).*
- ☐ *Sharing Information between Public Safety and Transportation Agencies for Traffic Incident Management, NCHRP 520, Transportation Research Board (available in pdf format at www.trb.org).*

Videos

- ☐ *Highway Workzone Safety: Grading Safety (14 Min)—Iowa Department of Transportation.* Discusses awareness while grading. The operator should be aware of the things around him and should be sure to check for utility signs.
- ☐ *Highway Work Zone Safety: Plant Site Safety (11 Min)—Iowa Department of Transportation.* Discusses the precautions to be taken at the plant site, teaches workers awareness of the equipment that is around them.
- ☐ *Highway Work Zone Safety: Removal/Demolition Safety (11 Min)—Iowa Department of Transportation.* Teaches safety while demolishing a structure.
- ☐ *Highway Work Zone Safety: Traffic Control Safety (11 Min)—Iowa Department of Transportation.* Discusses the safety measures to be followed while re-routing the vehicles on a construction site.

CD Roms

- ☐ *AASHTO 2002 Roadside Design Guide—USDOT, LTAP, NHI.*
- ☐ *Safer Journey, Interactive Bicycle Safety Awareness—FHWA.*
- ☐ *Safer Journey, Interactive Pedestrian Safety Awareness—FHWA.*
- ☐ *Maintenance of Signs and Sign Supports for Local Roads and Streets (Presentation and Instructors Manual) USDOT, Pennsylvania LTAP.*
- ☐ *Rubber Temporary Ramps, EZ Road, Inc.* Describes an alternative to HMA or cold-patch temporary ramps at milled butt joints, bridges, and end-of-day joints. (Illinois DOT tested and approved).

SPEED BUMP

Dave Coverly



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