



# LTAP MATTERS

Montana's Answers To Technical Education of Roads & Streets

Montana Local Technical Assistance Program 1-800-541-6671

College of Engineering

Montana State University

Bozeman, MT 59717-3910

Fall 2007    October    November    December

Vol.25, No.4

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### PASS IT ON

After you have read this newsletter, copy what you need for your files and pass it on to other interested readers in your department.

## Great Falls APWA Hosts 18th Annual Snow Rodeo

"This is our 18th year hosting the Equipment Training and Snow Rodeo here in Great Falls," said Marty Basta, Operations Manager, City of Great Falls. "With the training being provided by Montana LTAP on the first day and the level of competition



*Marty Basta, City of Great Falls*

rising each year for the rodeo on the second day, this event keeps drawing old and new competitors alike," commented Basta. He also mentioned that the rodeo would not be possible without the help from city and county employees, MDT and T&E Equipment. "It's definitely a team effort all the way around," Basta said.

Montana LTAP Director Steve Jenkins got the first day of training started off with weed mowing safety, followed by his winter survival module.

*Continued on Page 2...*



*Backhoe Competition*

**ADVISORY  
COMMITTEE  
MEMBERS**

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City of Bozeman

**Bob Burkhardt**  
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Montana Dept of Transportation

**Jim Rearden**  
City of Great Falls

**Sue Sillick**  
Montana Dept of Transportation

The Advisory Board meets annually to make recommendations and evaluate the effectiveness of the Montana LTAP program.

# Snow Rodeo (cont'd from Page 1)

The morning concluded with a panel presentation on Garbage Truck Driving Safety. Ross Bartell, City of Great Falls; Steve Johnson, City of Bozeman; and Ken Behling, City of Billings, led the discussion panel on various safety aspects when driving large trucks.

The afternoon session focused on staking a roadway curve with Jenkins offering classroom instruction on mathematics followed by a hands-on surveying and staking a curve outside the classroom. Jim Turnbow, City of Great Falls Street Superintendent also presented the hand method of surveying a curve. Participants also had an opportunity to try out various equipment provided by T&E.



# Snow Rodeo (cont'd from Page 2)

LTAP Matters is published by the Local Technical Assistance Program at Montana State University, Bozeman, Montana.

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*Who broke the bowling ball?*



*Waiting their turn*



*Watching intently*



*T&E: Kraig Pester, Doug Shipp, Tom Gossack*



*Look over there!*

While at the Snow Rodeo, MT LTAP Director Steve Jenkins was handed this "wisdom from an operator." Enjoy:

**100% Me**

*I'm 20% video games  
8% good  
30% screwing around  
and 20% brotherhood.*

*I'm 2% pizza  
5% boxer  
10% fall  
and 2% soccer.*

*I'm 2% basketball  
1% clean  
0% work  
and all protein.*

*Ulan Omdahl, Grade 3  
Shelby Elementary School, MT*

## 2007 Snow Rodeo Winners

There were sixteen counties represented at this year's Snow Rodeo and Equipment Training, along with four cities and MDT. Due to time constraints, only 65 competitors were allowed to sign up for competition. There were 71 who attended training on the first day. The equipment winners, shown in the photo below, are listed on the left. The winners with the diagnostic tests and written scores added in are listed on the right.

### All-Around Champion

Larry Chapman, Lewis & Clark County

#### Snow Plow Winners:

1st - Jim Bedwell, Hill County  
2nd - Rich West, Lewis & Clark County  
3rd - Dave Trusty, MDT  
1st Timer: Jim Bedwell, Hill County

#### Backhoe Winners:

1st - Troy Amunrud, Park County  
2nd - Travis Leslie, Lewis & Clark County  
3rd - Lloyd Omdahl, Toole County  
1st Timer: Troy Amunrud, Park County

#### Loader Winners:

1st - Dale Carlstad, Liberty County  
2nd - William Wertz, Broadwater County  
3rd - Matt Heckel, City of Bozeman  
1st Timer: Dale Carlstad, Liberty County

#### Motorgrader Winners:

1st - Fred Feller, Jefferson County  
2nd - Gene Olson, Jefferson County  
3rd - Larry Chapman, Lewis & Clark County  
1st Timer: Fred Feller, Jefferson County

### All-Around Champion

Tom Loggins, Butte-Silver Bow

#### Snow Plow Winners:

1st - Jim Bedwell, Hill County  
2nd - Rich West, Lewis & Clark County  
3rd - Dave Trusty, MDT  
1st Timer: Jim Bedwell, Hill County

#### Loader Winners:

1st - Matt Heckel, City of Bozeman  
2nd - Clay Caudle, Lewis & Clark County  
3rd - Rocky Teeters, City of Missoula  
1st Timer: Rocky Teeters, City of Missoula

#### Backhoe Winners:

1st - Tom Loggins, Butte-Silver Bow  
2nd - Ed Tinker, Lewis & Clark County  
3rd - Larry Ruhd, City of Bozeman  
1st Timer: Tom Loggins, Butte-Silver Bow

#### Motorgrader Winners:

1st - Larry Chapman, Lewis & Clark County  
2nd - Fred Feller, Jefferson County  
3rd - Gene Olson, Jefferson County  
1st Timer: Fred Feller, Jefferson County



Various Snow Rodeo Winners

# Put on the Brakes Day 10/10/07

## Safety Tips for October 10, 2007

Put the Brakes on! As drivers and pedestrians, we all want to reach our destinations safely. Here are some tips from the US DOT Federal Motor Carrier Safety Administration campaign, "Share the Road Safely" on doing exactly that.

### Car Drivers

- Cutting in front can cut your life short! Avoid cutting in front of other vehicles as you may create an emergency braking situation for others around you, especially in heavy traffic.
- Buckle your seat belt! ALWAYS!
- Watch your blind spots and the "No Zones" around trucks and buses.
- Inattentive drivers. While driving, please focus only on the road. If you need to attend to another matter while driving (cell phones, kids, application of cosmetics, etc.) safely pull over in a parking lot or rest stop.
- Avoid aggressive drivers and driving aggressively. Speeding, running red lights and stop signs, making frequent lane changes and tailgating can create dangerous and potentially fatal situations on the road.
- Avoid squeeze play. Be careful of trucks and buses making wide right turns. If you try to get in between the truck and the curb, you could be caught in a squeeze and suffer a serious accident.
- Never drink and drive!

### Motorcycle Drivers

- Watch the "No-Zones". Never hang out in a truck's blind spot or "No-Zone".
- Always wear a helmet!
- Drive to survive! Motorcycles are the smallest vehicles on the road and offer no protection in a crash. Be cautious, pay attention to the signals and brakes of other vehicles, especially trucks!
- Check yourself and your bike. Conduct a safety inspection of your motorcycle before each ride and be sure to wear the proper protective gear.
- Watch your speed!

### Truck and Bus Drivers

- Take care of yourself! The most important part of a moving truck or bus is the driver. Get plenty of rest before getting behind the wheel, eat well and stay fit!
- Always maintain your vehicle
- Be aware of your "No-Zone"! The "No-Zone" represents the danger areas, or blind spots, around trucks and buses where crashes are more likely to occur. Be vigilant in watching out for vehicles in the "No-Zone".
- Slow down in work zones!
- Always keep your distance - leave enough space between you and the vehicle in front of you.
- Fasten your seat belt. Buckle up for safety and control.
- Always drive defensively and AVOID aggressive drivers!
- Work to help yourselves. Help stranded motorists, notify traffic safety agencies of crashes, unsafe road conditions and other situations that can lead to crashes.

### Pedestrians

- Watch your walkways. Walk on sidewalks and in crosswalks whenever possible. Pay attention to walk signals and keep a safe distance when standing on corners.
- Know your "No Zones". Be aware of blind spots around trucks, buses and cars when walking near and around them.
- Stopping Distances. Use caution when crossing intersections and streets. You may think vehicles will stop for you, but they may not see you or even be able to stop. Never take a chance with a truck, even if the driver sees you, they may not be able to stop. Truck brakes and gears are notorious for sticking.
- Make Yourself Visible. Wear bright or reflective clothing.
- Watch out for wide loads. Trucks with wide loads may have very limited visibility as well as difficulty maneuvering.

### Bicyclists

- Wear your helmet!
- Bikers Beware. Always be aware of the traffic around you. Never assume that all drivers see you. Ride defensively.
- Check your brakes and be prepared to stop.
- Ride on the right side, with the flow of traffic.
- Beware of the "No-Zone". Never sneak in between a truck or bus and the curb, or you could get crushed. Be aware that large trucks have blind spots in the front, back and on the sides, which make it difficult for the driver to see around them.

*This information was obtained from "Put the Brakes on Fatalities Day" The Transportation and Development Institute of ASCE 1801 Alexander Bell Dr., Reston, VA 20191/www.tanddi.org. For more info, go to: <http://www.brakesonfatalities.org/>*

# A False Sense of Security: The Misconceptions About Alcohol's Effects on Driving

Permission was granted from Delaware T2 to reprint excerpts from this article from their Transearch Fall 2007 issue. This article was written by Adam L. Catherine, Graduate Student, and Julie Trick, Undergraduate Student; Dept. of Civil and Environmental Engineering, University of Delaware. For complete report please contact Montana LTAP.

Imagine yourself at a bar enjoying happy hour with your coworkers. You are talking, laughing, snacking on free food, and having a couple of drinks. Two glasses of wine, or two beers, and an hour and a half later, you decide to head home for the evening. It is now 6:00 pm and you have been at work since 8:00 am. You say goodbye to your coworkers, get into your car, and drive home. No one questions your level of intoxication because you have only had two drinks.

This situation occurs on a daily basis all across the United States. Every day, thousands of people in the Wilmington area, and throughout the country, visit bars in the evening. Many of you reading this article have been in similar situations. Do you ever consider the danger of just a few drinks? Most people do not. There is a false sense of security with regards to the drinking laws in the United States. While most states have a legal limit of 0.08 percent blood alcohol content (BAC), people can experience adverse effects at levels as low as 0.02 percent.

Now, imagine the following: while backing out of your parking space, you fail to see an approaching vehicle and it crashes into your car. You immediately start to panic. What if you crashed into that car because of the drinks you had at the bar? Are the police going to find out, and will you lose your license? You aren't showing signs of drunkenness such as slurred speech or difficulty standing, but you know that the police will smell alcohol on your breath. The officer asks if you have been drinking, and you tell the truth. The officer runs a breathalyzer test and you pass with a BAC of 0.04 percent, half of the legal limit. You receive no penalty and are allowed to leave.

What you don't know is that your peripheral vision was reduced and your reaction time was slowed because of your alcohol level. Your ability to conduct a complex driving maneuver such as backing out of a parking space was impaired. Even after drinking only two glasses of wine, or two cans of beer, you have impaired your ability to drive. You get on the internet and do some research of your own, finding out that many studies report that even moderate drinking, two drinks a day for men and one drink a day for women, can impair driving functions (Hingson et al., 1999). The degree of these impairments varies depending on a person's health, stomach contents, fatigue, age, and weight, among many other factors. The key to evaluating the effects of low doses of alcohol is to understand how it works in your body.

## Alcohol and You

All alcoholic beverages contain ethyl alcohol, in various concentrations, depending on the type of drink. When an alcoholic beverage is consumed, the liquid travels down the esophagus, through the stomach, and into the small intestine. Alcohol does not require preliminary digestion or breakdown to be absorbed. Instead, alcohol enters the bloodstream by simple diffusion from the gastrointestinal tract. The most efficient region for alcohol absorption in the gastrointestinal tract is the upper portion of the small intestine, which absorbs about 80% of the alcohol consumed. The other 20% of the alcohol is absorbed by the stomach (NIH, 2003).

The bloodstream is responsible for the rapid transport of alcohol throughout the body. Alcohol is absorbed into the bloodstream so quickly that it can be found in tissue organs and bodily secretions only moments after it has been ingested. As blood is

pumped throughout the body, alcohol is absorbed by the body tissues. Because alcohol is water soluble, it is absorbed into the body tissues in proportion to the water content of the tissues. Once absorption is complete, equilibrium occurs so that blood at all points in the body contains approximately the same alcohol concentration. Generally, after the consumption of one standard drink, the alcohol content in a drinker's blood peaks within 30 to 45 minutes (NIAAA, 1997).

## Alcohol and Driving

There are numerous ways that alcohol impairs driving performance, and there are many different levels of intoxication beginning as low as 0.02 percent. Figure 1 shows the BACs at which different driving functions become impaired.

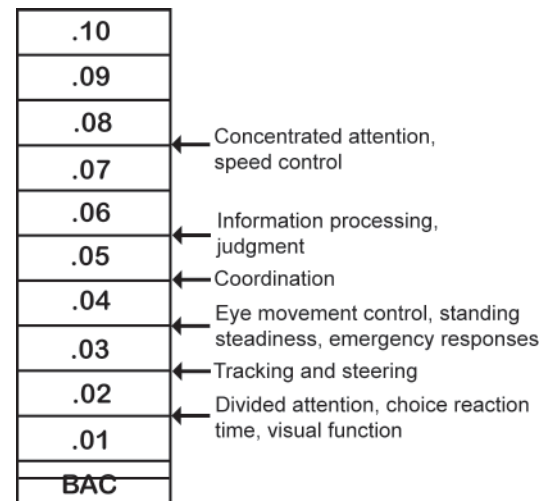


Figure 1 BAC and Impairment (MADD, 2007).

Some indicators of alcohol-impaired driving are weaving, swerving, drifting, following too closely, and breaking erratically. Individuals under the influence of alcohol also tend to turn with a wide radius, straddle the center of a lane marker, drive more than 10 mph below the speed limit, drive with their tires on the center lane marker, signal inconsistent with their driving actions, respond slowly to traffic signals, and stop inappropriately or without cause. Other characteristics of alcohol-impaired driving include driving on non-designated roads, turning abruptly or illegally, accelerating or decelerating rapidly,

# Alcohol's Effects on Driving (Cont'd from Page 6)

and driving with the car's headlights off. Two of the most dangerous alcohol-impaired driving behaviors are driving into opposing or crossing traffic, and almost striking an object or other vehicle.

Alcohol has been found to affect a person's reaction time, even at low levels. Alcohol does not alter a person's response to a single stimulus. Instead, the change in reaction time occurs during divided attention tasks, such as driving, where multiple stimuli are present simultaneously. Moskowitz and Burns (1971) conducted controlled studies that demonstrated the disruption of reaction time by alcohol at low dose levels (equivalent to one or two drinks). Studies of divided attention have demonstrated that alcohol use, even at low to moderate levels (below 0.1 mg %), may contribute to the high percentage of driving accidents (Jung, 1994). This effect was believed to be indirect, influencing information processing in the central nervous system and brain rather than directly through toxic effects on motor coordination or gross muscle movement.

Starting at BACs of 0.05, drivers experience impairment in eye movement, glare resistance, visual perception, reaction time, certain types of steering tasks, and information processing; all extremely important functions used while driving (Hingson, 1999). The reaction time - the time which elapses between the sensory stimuli, such as seeing another car, and when we move our arms to steer the car - is normally about one-fifth of a second. Alcohol slows this reaction time to be two, three, four, or even five-fifths of a second. At 60 mph, a car travels 18 feet in one-fifth of a second. So, instead of 18 feet, the car may travel 36, 54, 72, or even 90 feet before the driver takes any action (Burgess, 1973).

Drivers with BACs of 0.02 to 0.04 are 1.4 times more likely to be involved in a single-vehicle fatal crash than drivers that have consumed no alcohol. Drivers with BACs of 0.05 to 0.09 are 11.1 times more likely to be involved in a single-vehicle fatal crash than drivers that have had no alcohol. For drivers under the age of 21, the risk of being involved in a single-vehicle fatal crash increases exponentially with every 0.02 percent increase in BAC.

A study conducted in Canada by the Centre of Forensic Sciences tested professional race car drivers at levels from 0.04 to 0.15 percent BAC. The most important finding was that drivers failed to sense the attitude, or position, of the car. Also, the driving response to stimuli was usually late and exaggerated. Changes in the drivers' ability were observed at BAC as low as 0.04 percent (Burgess, 1973). Langer et al., conducted a series of experiments to examine the effects of conversation and low doses of alcohol on a driver's peripheral vision (2001).

They concluded that drivers experience significant decreases in their ability to respond to peripheral stimuli at BACs as low as 0.04 percent. Moskowitz et al., conducted a study in 2000 to determine the extent of impairments at BACs ranging from 0.02 to 0.10 percent. A total of 168 participants were divided into gender, age, and drinking practices groups, and subjected to a series of driving tests conducted on a driving simulator. The results showed that major driving-related skills were impaired at BACs as low as 0.02 percent. In this study, there were no measurable differences in the effects of alcohol between age, gender, and drinking practices groups.

“...results showed that major driving-related skills were impaired at BACs as low as 0.02 percent.”

## What Now?

It is a general consensus that drivers can experience the effects of alcohol at doses as low as 0.02 percent, with more significant impairments starting at BACs of 0.04. It is interesting, however, that the BAC limit in most states is 0.08, which is two times that which has been determined to cause significant driving impairments. The public needs to be more aware of this problem. Educational programs about alcohol consumption and impairment must be developed in order to stress the fact that drivers do not need a BAC of 0.08 to pose a threat to themselves and others.

In addition to educational efforts, a reduction in the legal BAC must be considered. Hingson et al., reports that research has confirmed the effectiveness of lowering the legal BAC limit from 0.10 to 0.08 percent. However, further reduction is still needed. Some states, such as Maine, have enacted zero-tolerance policies in which BAC limits are reduced to 0.05 percent for drivers with a DWI (Hingson, 1999). Why restrict this reduction to people convicted of DWIs? Statistics show that the majority of alcohol-related crashes are caused by first-time offenders (MADD, 2007). An effort should be made to examine the issues surrounding the effects of low doses of alcohol on driver reaction time in order to support a movement to reduce the legal limit to 0.05 percent. Combining this with the educational program and enforcement will ensure a further reduction in alcohol-related crashes and fatalities.



National Traffic Management & Work Zone Safety Conference  
 October 9-12, 2007  
 Fort Lauderdale, FL  
 Contact Lisa Kelley McCluskey,  
 Communications and  
 Clearinghouse Manager, LTAP/  
 TTAP Clearinghouse  
 American Road and  
 Transportation Builders  
 Association  
 202 289-4434.

**HMA ENERGY AND  
 RECYCLING SYMPOSIUM  
 OCTOBER 22-23, 2007  
 AUSTIN, TEXAS**

This one and a half day workshop will focus on hot-mix asphalt (HMA) recycling and on energy issues affecting the production and price of HMA. The event is to be co-sponsored by the Federal Highway Administration (FHWA). The Symposium will offer a variety of engaging sessions led by dynamic speakers who represent the latest thinking in the contracting community, industry, academia, and public agencies. Topics to be covered include energy savings and asphalt recycling for the future; asphalt supply; aggregate issues; high-performance mixes; DOT and FHWA perspectives on recycling; energy savings through plant efficiency; reducing transportation costs and the cost of drying aggregates; mix design for HMA recycling; warm-mix asphalt and recycling, and much more. Participation in this Symposium could be the key to savings of hundreds of thousands of dollars for our industry. Sessions will begin at 1:00 pm on Monday, October 22, and conclude at 3:00 pm on Tuesday, October 23.

Online registration is available at [www.hotmix.org](http://www.hotmix.org). For questions, contact Carol Metzger, NAPA's Assistant Meeting Planner, at (301) 731-4748.

# Annual Calendar 2007

January 2007	February 2007	March 2007																																																																																																																																					
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Some dates & locations subject to change. Call LTAP, 1-800-541-6671 or 406-994-6100 to confirm.



# Calendar of Events 2007 & 2008

## League of Cities & Towns Annual Conference

**October 3 - October 5, 2007**

76th Annual League Conference is being held at:

Best Western GranTree Inn

1325 N. 7th Avenue

Bozeman, Montana

(406) 587-5261

For more information about the conference:

Montana League of Cities and Towns

208 N. Montana Avenue - Suite 201

Helena, Montana 59601

406 442-8768 E-mail: mlct@mt.net

## MACRS Fall District Meetings

- |                |                         |
|----------------|-------------------------|
| • Glendive     | <b>October 10, 2007</b> |
| • Billings     | <b>October 11, 2007</b> |
| • Twin Bridges | <b>October 16, 2007</b> |
| • Missoula     | <b>October 17, 2007</b> |
| • Conrad       | <b>October 18, 2007</b> |

### Gravel Road Equipment Training:

- |                 |                           |
|-----------------|---------------------------|
| 8:00 - 10:00 am | Classroom Instruction     |
| 10:00 am - Noon | Field Work - At Road Site |
| Noon            | Lunch                     |
| 1:00 - 4:00 pm  | Field Work - At Road Site |

Contact Montana LTAP at 1-800-541-6671, regarding registrations or inquiries. Brochures were mailed August 21 with registration forms. Montana LTAP will be happy to fax the brochure or go out on [www.coe.montana.edu/ltap](http://www.coe.montana.edu/ltap) and click on Training and then on "brochure" under the MACRS Workforce Development announcement.

## MACo Loss Control Conference - January 14-16, 2008

**GranTree Inn, Bozeman, Montana**

**Monday:**

**Emelia McEwen, MACo Risk Manager    January 14, 2008**

**Tuesday:**

**Steven V. Jenkins, MT LTAP Director    January 15, 2008**

- Topics: Proper Sign Placement & Sign Vandlism  
Work Zone Technician  
Rural Safety Reviews

**Wednesday:**

**Law Enforcement Topics    January 16, 2008**

Contact MACo at 406-444-4360, e-mail: [maco@maco.cog.mt.us](mailto:maco@maco.cog.mt.us) or visit their website at <http://maco.cog.mt.us/>. More information will be coming in December from Montana LTAP.

October 13, 2007  
3rd Annual Public Works  
Awareness Event  
City of Bozeman  
Gallatin Valley Mall  
Bozeman, MT

City of Bozeman provides safety information for the public. Several equipment scenarios are also set up for the public to participate in and get a better understanding of what road employees are up against during the winter months.

### 2008 MACRS

**Spring Conference**

March 31-April 3, 2008

Red Lion Colonial Hotel

2301 Colonial Drive

Helena, MT

406-443-2100

**Brochures with registration forms for participants and vendors will be available the end of January 2008 from Montana LTAP.**

### MACo

**Mid-Winter Conference**

Holiday Inn

Billings, MT

February 11-15, 2008

<http://maco.cog.mt.us/>

Montana Association of Counties

2715 Skyway Drive

Helena, MT 59602-1213

Email: [maco@maco.cog.mt.us](mailto:maco@maco.cog.mt.us)

Phone: 406-444-4360

AASHTO Annual Meeting to Explore Bridge Issues, Global Warming Actions by state and federal officials to address the needs of the nation's bridges and approaches to help curb global warming will be among topics discussed by state transportation department directors at the AASHTO Annual Meeting, September 27–October 1 at the Midwest Airlines Center in Milwaukee, Wisconsin.

"This is an excellent opportunity for the chief executive officers of the state transportation departments to share the latest information regarding bridge and infrastructure issues, including possible financing, and to continue their work on the long-term vision for our surface transportation system," said John Horsley, Executive Director of AASHTO.

One speaker at the Sunday Plenary Session will be Bill Nye, "The Science Guy," who will speak on global warming. The meeting also will feature a trade fair, the investiture of AASHTO's new president for the year 2008, and a ceremony honoring AASHTO award-winners. AASHTO's Executive Committee and Board of Directors will hold sessions. Conference sessions include energy issues for state transportation departments; new trends in financing; taking action to combat traffic congestion; growth and development of intercity passenger rail; and impacts of climate change on transportation infrastructure. During the Saturday session of the Annual Meeting Trade Fair, teams of students from across Wisconsin will compete in an engineering design challenge, for prizes. The competition—which will include a team of adult professional engineers competing just for fun—is part of AASHTO's TRAC program, which provides curriculum to middle schools and high schools that gives students background in the principles of engineering. For more information on the AASHTO Annual Meeting, or to register, see the website:

<http://www.dot.wisconsin.gov/business/engserv/aashto-index.htm>.

AASHTO Journal  
September 21, 2007

## From MACRS President Jim McCarthy

Hello to All,

The summer is coming to a close. After all the long, hot days, the smoke-filled skies and the rush from all the yet-to-be completed projects, it is time to stop for a moment and reflect upon the good things about living in Montana. Also, it is time to look at the needs and goals of our association in the upcoming year.

The Workforce Training sessions were held this spring throughout the state and they were successful with good attendance numbers. The upcoming District meetings this fall will help keep us going in the right direction.

The District Meetings this year will be held in October in Glendive, Billings, Twin Bridges, Missoula, and Conrad. These meetings are key to getting the local county officials, road staff, and other interested parties together to listen to and be part of the discussion concerning their road issues while obtaining valuable information and techniques. These meetings also provide input as to what needs and issues should be slated for the annual 2008 spring conference. Questionnaires from these meetings will be reviewed



MACRS President Jim McCarthy

at the pre-planning meeting in Lewistown, November 13 and 14, so we can develop an interesting and educational conference for Helena next spring. We are also trying to develop a directory with related information of task specific projects and contacts for those tasks. More information will be available at the District Meetings ...so plan on attending to hear more!

As President of the Association this year, I look forward to developing some new things for training and educational tools. Hopefully we can put together an interesting and terrific conference in the spring. I would urge all of the officers and the new District Reps to get involved and contact the local and neighboring counties and get them to attend a District meeting, and sign up for the annual conference. The message is clear and the information is invaluable.

If anyone has any suggestions or ideas to promote our organization, or improve our message, please feel free to call me at 406-497-6567 or e-mail me at [jmccarthy@bsb.mt.gov](mailto:jmccarthy@bsb.mt.gov)

Thanks for all of your help,

*Jim McCarthy  
Road Foreman*

*Butte Silver Bow Department of Public Works  
1700 Civic Center Road  
Butte, MT 59701*

## Writing a Winter Maintenance Policy

The Salt Institute's publications list has interesting information about winter maintenance for road departments such as the article on "Creating a Written Plan and Policy" regarding winter maintenance. They mention how important it is to include all agencies with any type of transportation emergencies be involved with the writing effort.

The article cited two agencies that have policies written:

•<http://www.co.rockland.ny.us/Highway/hwydocs/Snow%20and%20Ice%20Control%20Policy%202002.pdf>

•<http://www.twp.cranberry.pa.us/publicworks/SNOWICECONTROL04.pdf>

If you would like to read more about this process, go to their article: <http://www.saltinstitute.org/publications/shd/shd-summer-2006.pdf> or visit their website at <http://www.saltinstitute.org/21.html>

*Courtesy of Salt Institute*

# Fish Passage in Culverts

*FISH PASSAGE IN CULVERTS RESEARCH PROJECTS RECENTLY COMPLETED by Joel Cahoon, Montana State University. This research was funded by MDT. Permission granted to reprint this article from MDT.*

Fish passage through culverts is an issue that has been in the forefront in recent years. We all want healthy Montana fisheries, but at the same time we recognize that limited budgets can force some tough

decisions when it comes to balancing aquatic habitat with transportation needs. Two MDT research projects have just been completed that shed significant light on this issue

One project was a follow-up to the MDT research project previously conducted in the Seeley Lake area. The Phase II project specifically examined passage as a probabilistic occurrence, and observed the probabilities of fish moving through successive points in a drainage, between culverts and through them.

The project team instrumented a tributary to the Yellowstone River near Gardiner to demonstrate a strong statistical relationship between the probability of fish passing through a culvert and the water velocity in the culvert. This is a significant finding and deviates from previous studies that proposed a simple pass/no pass velocity.

The project also demonstrated that the probability of fish passing through a series of culverts can be adequately expressed as the cumulative probability of fish passing individual culverts. These cumulative probabilities should be considered in combination with estimates of upstream habitat quality and availability, and should be weighed against available funds for culvert installation or replacement projects.



The second project focused on warm water fish species that are found in the settings of Eastern Montana. Prior to this project, there was only a small amount of anecdotal information about the mobility tendencies of prairie fish and their physical capacity to traverse the barriers that can be imposed by a culvert. This project, conducted on tributaries to the Yellowstone River near Glendive, demonstrated that a large number of species were well distributed in reaches with culverts.

For all species but one (Longnose Dace), the culverts in the study were not a significant barrier to upstream fish passage. This can be attributed in part to the fact that the culverts in the study closely mimicked the habitats and low gradient of the streams, by having streambed material and similar stream velocities in the culvert barrel, and small outlet drops compared to culverts often seen in steeper mountainous drainages.

Overall this study reinforces the notion that culverts should mimic the aquatic habitats and hydraulic conditions of streams with a fishery resource, while still meeting the hydraulic, hydrologic, safety, maintenance, and road bearing needs of the system.

In both projects, analyses were undertaken demonstrating the software FishXing, the contemporary tool of choice for many culvert experts, can be a valuable design tool for new culverts.

FishXing also tends to do a good job of identifying existing culverts that are passable to many Montana fish species. Findings from both studies indicated that the model does not perform as well at identifying existing culverts that are potential barriers to fish passage, as fish passage was observed at a significant proportion of culverts classified as barriers by the model. So when the model indicates that a culvert is a barrier, more detailed studies of the culvert should be undertaken.



Finally, a recommended design procedure is also presented in these reports, which can be viewed at these links:

[http://www.mdt.mt.gov/research/projects/env/fish\\_passage.shtml](http://www.mdt.mt.gov/research/projects/env/fish_passage.shtml)

[http://www.mdt.mt.gov/research/projects/env/fish\\_passage\\_warm.shtml](http://www.mdt.mt.gov/research/projects/env/fish_passage_warm.shtml)

For more information, contact Sue Sillick at 406.444.7693 or [ssillick@mt.gov](mailto:ssillick@mt.gov).

# Montana LTAP Lending Library

## Publications

Welcome to the LTAP Lending Library where publications, videos, and software may be borrowed for two weeks and then returned to the Library. Up to three videotapes may be borrowed from the LTAP Lending Library rent-free for two weeks. Some publications are free or for a nominal charge upon request.

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You will find the total library publications, software, and videos lists at this web site: [www.coe.montana.edu/ltap](http://www.coe.montana.edu/ltap). You can also keep track of upcoming workshops, our newsletter, and "What's New" items that change periodically.

p-226 Low-Volume Roads 2007, Volume 1, TRB No. 1989

This is the ninth in a collection of peer-reviewed papers regarding low-volume road research. Every four years since 1975, this series of publications has collected the work of authors from six continents and more than 40 countries to share experiences and innovations. The two volumes of this Record contain a keynote paper and 80 technical papers of the highest quality that are pertinent to low-volume road systems. Viewed also at [www.trb.org](http://www.trb.org). (359 pages)

p-230 Low-Cost Treatments for Horizontal Curve Safety (FHWA December 2006)

This Guide identified 20 strategies as alternative countermeasures—or treatments—to address the specific safety problem at horizontal curves. (Lists cost and examples.) These strategies share one of two objectives: 1. Reduce the likelihood of a vehicle leaving its lane and either crossing the roadway centerline or leaving the roadway at a horizontal curve. 2. Minimize the damaging consequences of a vehicle leaving the roadway at a horizontal curve. (56 pages)

p-235 NCHRP Report 440: Accident Mitigation Guide for Congested Rural Two-Lane Highways (TRB 2000)

This guide will assist planners, designers, and traffic engineers in identifying and designing projects to improve safety on congested rural two-lane highways. The guide assumes that widening the road to four lanes is not a practical solution because of financial, environmental, or societal constraints. Geometric, traffic control, and other types of countermeasures are discussed. (164 pages)

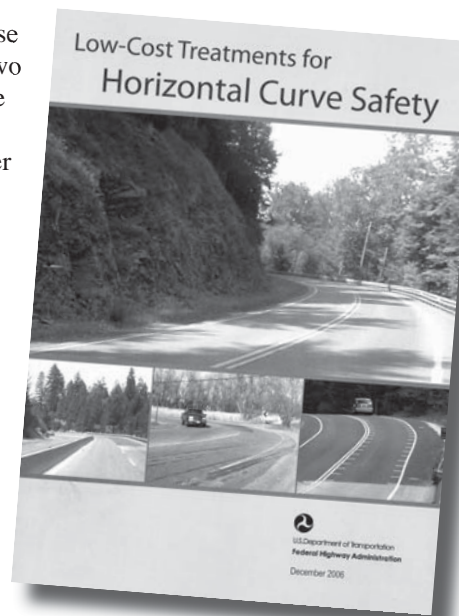
p-286 Context Sensitive Roadway Surfacing Selection Guide (FHWA August 2005)  
This Guide documents the available options for roadway surfacing, and provides a decision-making process to allow consideration of all conventional engineering design factors, such as, structural capacity, performance, durability, safety, life-cycle costs, but will also allow consideration of aesthetics, context compatibility, and environmental impacts. (A CD-ROM titled Roadway Surfacing Option Photo Album accompanies this Guide.) (346 pages)

p-287 Subsurface Imaging of Lava Tubes, Roadway Applications (FHWA September 2005)

This report contains the details of geophysical surveys performed at the Lava Beds National Monument in northern California. The geophysical surveys were performed over several areas with known lava tubes. This report provides the geological site conditions, overviews of the geophysical methods, summary of the results, and overall recommendations that should be considered for future void detection. (137 pages)

p-288 INSAR Applications for Highway Transportation Projects (FHWA April 2006)  
Satellite Synthetic aperture radar (SAR) technology, in combination with interferometry (InSAR), has the ability to measure topography or ground movement to sub-centimeter accuracy.

This project's objective was to establish and demonstrate reliable, cost effective procedure to measure ground movement using InSAR in support of federal highways projects. Three sites were studied in Washington and Colorado. (100 pages)



# Montana LTAP Lending Library

p-373 Chip Seals (TEEX February 2007) This reference manual contains information from Module 2-4, Chips Seals, NHI. It describes recommended design steps and construction procedures associated with constructing good quality chip seal treatments on existing hot-mix asphalt (HMA) pavements. (44 pages)

p-374 Guidelines for Using Prime and Tack Coats (FHWA July 2005) The objective of this study was to produce a prime and tack coat guide publication developed for project development and field personnel to provide decision-making guidance on how to use, when to keep, and when to eliminate prime and tack coats. (110 pages)

p-400 Users Manual for LS-DYNA Concrete Material Model 159 (FHWA May 2007) This manual documents the theory of the concrete material model, describes the required input format, and includes example problems for use as a learning tool. (89 pages)

p-401 Evaluation of LS-DYNA Concrete Material Model 159 (FHWA May 2007) This manual documents the evaluation of the concrete material model, including the selection of the concrete model input parameters. (206 pages)

p-402 Freeze-Thaw Resistance of Concrete with Marginal Air Content (FHWA December 2006) This study evaluated the freeze-thaw resistance of several "marginal" air void mixes, with two different types of air-entraining admixtures (AEA)—a Vinsol resin and a synthetic admixture. This study used rapid cycles of freezing and thawing in plain water, in the absence of deicing salts. (93 pages)

p-405 The Use of Lithium to Prevent or Mitigate Alkali-Silica Reaction in a Concrete Pavements and Structures (FHWA March 2007) This document is intended to provide practitioners with the necessary information and guidance to test, specify, and use lithium compounds in new concrete construction, as well as in repair and service life extension applications. (62 pages)

p-445 Corrosion Resistant Alloys for Reinforced Concrete (FHWA July 2007) This investigation was initiated to evaluate the corrosion resistance of various types of corrosion resistant reinforcement, including new products that are becoming available, in bridge structures that are exposed to chlorides. This interim report presents results from the initial 3 years of an overall 5-year program. (132 pages)

p-446 Multiple Corrosion Protection Systems for Reinforced Concrete Bridge Components (FHWA July 2007) Eleven systems combining epoxy-coated reinforcement with another corrosion protection system are evaluated using the rapid macrocell, Southern Exposure, cracked beam, and linear polarization resistance tests. The results presented in this report represent the findings obtained during the first half of a 5-year study that includes longer-term ASTM G 109 and field tests. (92 pages)

p-560 Shored Mechanically Stabilized Earth (SMSE) Wall Systems Design Guidelines (FHWA February 2006) The purpose of this design guideline is to serve as the FLH standard reference for roadway projects using shored MSE walls. (230 pages)

p-561 Durability of Segmental Retaining Wall Blocks: Final Report (FHWA April 2007) This report summarizes the key findings of this project and provides guidance on producing durable SRW (segmental retaining wall) blocks to ensure long-term performance of SRW systems in highway applications. (271 pages)

p-948A Traffic Detector handbook: Third Edition Volume I (FHWA October 2006) The objective of this Handbook is to provide a comprehensive resource for selecting, designing, installing and maintaining traffic sensors for signalized intersections and freeways (Volume I). (288 pages)

p-948B Traffic Detector Handbook: Third Edition Volume II (FHWA October 2006) The objective of this Handbook is to provide a comprehensive resource for selecting, designing, installing and maintaining traffic sensors for signalized intersections and freeways (Volume II). (394 pages)

9th International Conference on Low-Volume Roads: Plenary Session Video Now Available

TRB held the 9th International Conference on Low-Volume Roads on June 24-27, 2007, in Austin, Texas. The Conference highlighted the latest in international low-volume road topics and innovations in areas such as safety improvements, environmental design, highway and road design best practices, innovative road surface treatments, and more. A video recording of the plenary session, which included the following presentations, is now available.

\* The Road Ahead, J. Richard Capka, Federal Highway Administration

\* The Influence of Non-Technical Factors on the Planning and Provision of Low Volume Roads, Nazir Alli, South African National Roads Agency

\* From the Farm to the Market: The Texas FM Story, Michael Behrens, Texas Department of Transportation

\* Keynote Address: Planning Roads for Rural Communities, Maryvonne Plessis-Fraissard, World Bank

[http://www.trb.org/news/blurb\\_detail.asp?id=4534](http://www.trb.org/news/blurb_detail.asp?id=4534)

## Recorded Lowest Highway Fatality Rate Ever

There were 868 fewer deaths on the nation's highways in 2006 than there were in 2005, leaving 2006 as the year with the lowest highway fatality rate ever recorded and the largest drop in total deaths in 15 years, U.S. Transportation Secretary Mary E. Peters announced this week. The U.S. Department of Transportation released final figures for 2006 fatalities through its agency, the National Highway Traffic Safety Administration, which compiles the statistics. In 2006, 42,642 people died in vehicle wrecks. The number, a 2 percent decline in traffic deaths, contributed to the year's historic low fatality rate of 1.42 per 100 million vehicle miles traveled, Peters said.

Injuries also were down in 2006, with injuries to occupants or drivers of passenger cars down by 6.2 percent and injuries sustained in wrecks involving large trucks falling by 15 percent, she said. Peters cautioned that troubling trends continue in motorcycle and alcohol-related crashes. Alcohol-related fatalities rose slightly in 2006 over the previous year, while motorcycle deaths rose by 5.1 percent. 2006 marked the ninth consecutive year that NHTSA has recorded an increase in motorcycle fatalities. "Proper training, clothing, gear and, above all, helmet use are essential to reversing this deadly trend," Peters said.

NHTSA Administrator Nicole Nason said drunken-driving enforcement will continue to be a top priority for the department, noting that there was no improvement in 2006 for that category of fatalities compared with 2005. In 2006, 15,121 fatalities involved a driver or motorcycle operator, pedestrian or cyclist who had a .08 or higher blood-alcohol concentration, compared to 15,102 in 2005, she said. "For every alcohol-related fatality, the family left behind is shattered forever," Nason said.

The 2006 report on highway deaths and injuries can be found at the website <http://www-nrd.nhtsa.dot.gov/Pubs/810791.PDF>.

From AASHTO Journal, July 27, 2007

# Montana LTAP Lending Library

## Publications (Cont'd)

p-960 Active Traffic Management: The Next Step in Congestion Management (FHWA July 2007)

The purpose of this scanning study was to examine the congestion management programs, policies, and experiences of other countries that are in the planning stages, have been implemented, or are operating on freeway facilities. (73 pages)

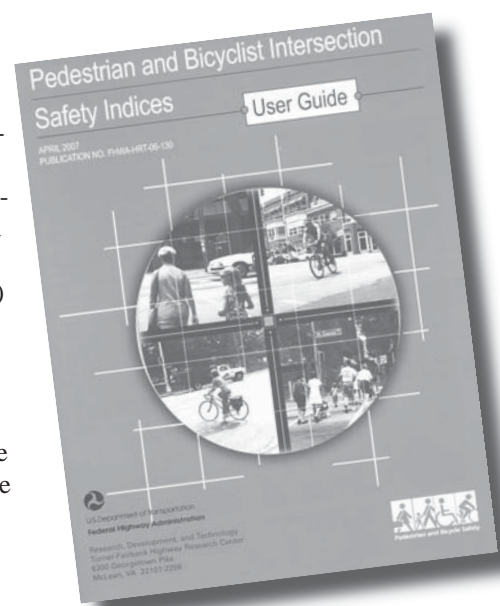
p-2395 Audit Stewardship and Oversight of Large and Innovatively Funded Projects in Europe (FHWA March 2007) The scan team observed that the terms of public-private partnership contracts have evolved as the European countries have gained experience in their use, and business models and evaluations have become an integral part of project selection and monitoring. (56 pages)

p-2396 Transportation Invest in Our Future: Revenue Sources to Fund Transportation Needs (AASHTO April 2007) This report addresses questions which frame the background for the revenue options to be considered, and a needs assessment summary; revenue crisis Congress will have to address in 2009; short-term federal revenue options for the Highway Trust fund; short-term federal revenue options outside the Highway Trust fund; state and local government revenue options; and long-term federal revenue options. (52 pages)

p-2397 Transportation Invest in Our Futures: Surface Transportation Policy Recommendations (AASHTO March 2007) This report reviews AASHTO's surface transportation policy recommendations, highway improvements needed, transit improvements needed, addresses rail needs, transportation safety needs, transportation revenue needs, and recommendations for the federal program. (95 pages)

p-2400 At the Crossroads, Preserving Our Highway Investment (National Center for pavement Preservation 2007) This document was written to stimulate serious discussion about the nation's highways,

including their role, extent, how they are financed, constructed, maintained, and to explore more effective and efficient ways of achieving our transportation objectives. This document should be of greatest interest to policy and decision makers such as elected officials, agency administrators, and senior technical personnel such as engineers and planners who have broad responsibility for making program and project-level decisions. (65 pages)



p-2567 Pedestrian and Bicyclist Intersection Safety Indices - User Guide (FHWA April 2007) The primary objective of this study was to develop safety indices to allow engineers, planners, and other practitioners to proactively prioritize intersection crosswalks and intersection approaches with respect to pedestrian and bicycle safety. (59 pages)

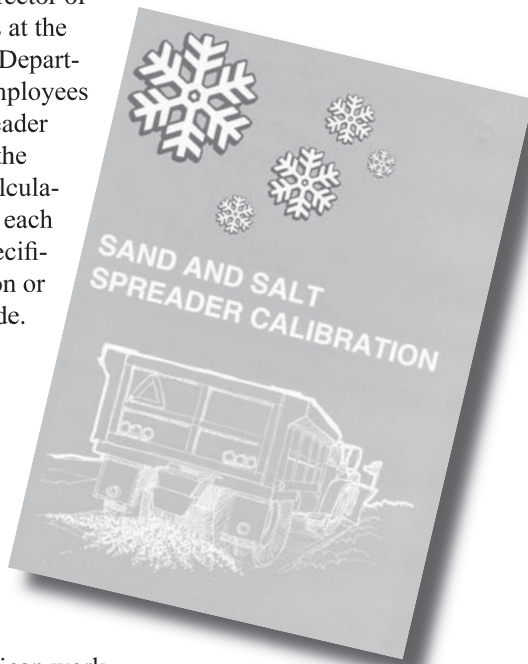
p-2568 Pedestrian and Bicyclist Intersection Safety Indices - Final Report (FHWA November 2006) The primary objective of this study was to develop safety indices to allow engineers, planners, and other practitioners to proactively prioritize intersection crosswalks and intersection approaches with respect to pedestrian and bicycle safety. Practitioners will be able to use these models on a small or large scale to determine where best to focus efforts to improve pedestrian and bicyclist safety. (96 pages)

# Montana LTAP Lending Library

## DVD's

**DVD210** Accelerated Construction of urban Intersections with Portland Cement concrete pavement (University of Washington 2002) This DVD presents the necessity of using concrete on certain urban intersections and the process to determine how and when.  
(12 minutes)

**DVD730** Sand and Salt Spreader Calibration (University of Massachusetts, Amherst 2006) Paul Brown, Director of Snow and Ice Operations at the Massachusetts Highway Department, guides highway employees through a successful spreader calibration and explains the proper techniques and calculations. You must calibrate each spreader according to specifications each winter season or whenever repairs are made. This will reduce waste, increase efficiency and protect the environment through better control of material application.  
(13 minutes)



**DVD821** Step by Step (Coastal 2006) Each year more than 200,000 American workers are injured as the result of slips and falls. This video program alerts your employees to the serious consequences of falls and explains how most falls can be prevented.  
(17 minutes)

**DVD824** Hand Safety, It's in Your Hands (Coastal 2006) This program takes a look at common workplace hazards your workers face and how to prevent hand injuries that may be caused by them. It covers:

- Wearing the right hand protection
- Using machine guards
- Using the right tool for the task
- Keeping equipment in proper working order
- Taking good care of gloves.

(18 minutes)

## Software

**SW222** Application of Ground Anchors and Soil Nails in Roadway construction (FHWA April 2007) Three training CD's

**SW240** Road Engineering and construction Practices for cold Regions (FHWA April 2007) Two training CD's

**SW350** Good Practices: Incorporating Safety into Resurfacing and Restoration Projects (FHWA December 2006)

**SW551** Introduction to Geosynthetic in Transportation (GMA 2007)

**SW840** Safe Routes to School Program (3M Traffic Safety Solutions 2006) 3M products and expertise help agencies develop on-target SRTS funding requests for school zone safety-improvement projects.

**SW935** Work Zone Training Law Enforcement Course (FHWA 2007) Pocket guide, Instructors guide, participants workbook, ppt training modules, promotional flyer, website links and other essential information.

**SW1025** Driver Understanding of Red Retroreflective Raised Pavement Markers (FHWA November 2006)

**SW2510** TransWrite (Executive Writing Associates 2005) Writing that works for transportation professionals – DEMO

**SW3010** Montana Transportation Officials & Engineers Directory (ARTBA 2007) Excel page with addresses and phone numbers of MDT and Montana-based transportation officials.



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This newsletter is designed to keep you informed about new publications, techniques, and new training opportunities that may be helpful to you and your community.

Present and past issues are available at [www.coe.montana.edu/ltap](http://www.coe.montana.edu/ltap) or by calling 1-800-541-6671.

### Editorial Contributions Welcome

LTAP welcomes contributions to *LTAP MATTERS*. Those wishing to submit relevant material to be published in the next newsletter can submit their ideas and articles to:

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