

LTAP MATTERS

Montana's Answers To Technical Education of Roads & Streets
Vol. 33, No. 1

Winter 2015

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MONTANA
STATE UNIVERSITY

Local Technical
Assistance Program

From Montana LTAP Director

This past fall I have had the good fortune to meet and greet numerous county road and city street officials while traveling to training events. Developing these relationships take time and effort with the dividends paying big time. The Montana Association of County Road Supervisors (MACRS) just finished up their Fall Meetings held in Miles City, Billings, Hot Springs, Butte and Helena. The topic of Reading Construction Plans was not attended as well as other topics from past falls but those who did participate made up the difference with their enthusiasm. Reviewing surveying methods tied in with GIS/GPS information as well as being able to read grade stakes kept attendees' interests. I was joined by Tom Cavanaugh, P.E., Robert Peccia and Associates, who provided actual construction plans and technical advice.

The Montana League of Cities and Towns 83rd Conference held in West Yellowstone afforded a day's training with Montana Public Works Directors from across the state. This event brings a variety of cities and towns with specific interests. As we have over the past years, Montana LTAP arranged topics and speakers for the PWD meeting day. My segment on the program involved the importance of PASER, PAVement and Surface Evaluation Rating, for their street inventories. This simplified rating system provides assistance to those who do not have the money and/or man-power to conduct an in depth road inventory but at least can give an overview rating of their streets at a specific time. This same method is being used by Montana county road departments as we assist them in gathering road inventories for 2014-2015 to compare to the road inventories gathered in 2008-2009.

Another avenue for interchange with fellow Montanans was at the KUSM television station the end of October where I was invited to participate on a panel for Montana Ag Live, with the titled program called "Long and Winding Roads in Montana." This gave me an opportunity to share with the public what and who we provide training for as well as road assistance.

The very fact our program was based on the Agricultural Extension Program provided a perfect connection with Montana AgLive. Although the other three people were more involved with plants, gardens, and ag-economy, interestingly enough these tied in with roads when discussions came up about weed control and maintaining farm-to-market roads. Go to this link to watch entire program: <http://watch.montanapbs.org/video/2365355372/>

The warm fall weather afforded many county road and city street departments the opportunity to catch up with all those projects usually put on hold by now due to snow fall. As we head into the winter months, be sure to check out our recorded December monthly webinars – on Winter Maintenance and Winter Survival. Both topics, even though only thirty minutes, offer vital winter information to county road and city street departments. Go to our website: <http://www.coe.montana.edu/ltapv2/resources/webinars/index.html>

Upcoming training for January will include our 13th Annual Safety Congress on January 26, 27, and 28 in Great Falls. Be sure to check our calendar and website for more information. February 12, 2015, we will be hosting the Asphalt Conference in Helena partnering with the Asphalt Institute. March will include a week of work zone training in different cities and save the dates for the MACRS Spring Conference March 30 to April 2, 2015, Great Falls.

As always, Montana LTAP is here to assist. Over the past thirty years, we have created a network of transportation contacts including the other fifty-seven LTAPs/TTAPs located throughout the United States and Puerto Rico.

Travel safe and slow down on those icy and snow-packed roads,

Steve Jenkins, Montana LTAP Director



Local Technical Assistance Program

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LTAP Matters is published by the Local Technical Assistance Program. LTAP is located at Western Transportation Institute, College of Engineering, Montana State University, Bozeman, Montana.

We can be reached at the following:

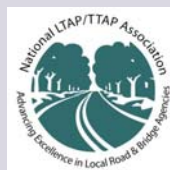
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FAX: (406) 994-5333

E-Mail: [MTLTAP\(at\)coe.montana.edu](mailto:MTLTAP(at)coe.montana.edu)

Our website lists upcoming training courses, registration forms, library information, our contact information, newsletters, various links, and MACRS information. Please go to: <http://www.coe.montana.edu/ltapv2/index.html>

The Local Technical Assistance Program/Tribal Technical Assistance Program (LTAP/TTAP) is a nationwide network of 58 centers - one in every state, seven serving Native American tribal governments and one in Puerto Rico.



The LTAP/TTAP Mission is to foster a safe, efficient, and environmentally sound surface transportation system by improving skills and increasing knowledge of the transportation workforce and decision makers.

MT LTAP ADVISORY COMMITTEE MEMBERS

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

Steve Albert

WTI Director

Harold Blattie

MACo

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Transportation

Thomas Danenhower

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Bob Seliskar

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Administration

John Van Delinder

City of Bozeman

Front Page Photo: Winter Bozeman Road by Michele Beck

Communicating with the Public

Over the years, Montana LTAP has gathered and created several documents to assist local governments when the public asks tough questions. Following are resources local governments can use to help answer these questions.

Why isn't the city plowing the snow off my road?

Winter Plowing Priority List:

Districts

Each equipment operator is assigned a certain area for snow plowing during the year. When need arises, operators will assist in other areas of the County, depending on snow conditions.

School Bus Routes

School bus routes are given first priority.

High-Use Roads

High Volume Roads are given second priority.

Other Roads

Paved roads that are not school bus routes are given third priority. Gravel roads which are not school bus routes are given fourth priority. Unimproved dirt roads will be plowed as time allows and upon request.

Snow Removal for State Highway or other Jurisdiction

•Contract services with providers or cooperative agreements with MDT, Cities, BLM, FWP, or other government agencies.

Operations

- Equipment used for snow removal includes snowplows, motor graders, loaders, trucks, and chemical applicators.
- Abrasive material used to improve traction once a snow or ice floor (or frost) is established will be 3/8 minus graded material and sand. Rock salt or proprietary products may also be used.
- Liquid Products: Salt brine, Magnesium Chloride, Calcium Chloride, may also be used for a variety of applications.
- Applications include: 1. Anti-icing 2. Deicing
3. Treatment with abrasives
- Snow fences are established in areas to prevent drifting of snow on roadways.

Procedures

Jurisdiction roads will be kept as passable and as safe as natural occurrences allow. Winter storms vary in duration and severity. Officials will use forethought judgment and skill to match maintenance application to winter storms and allowable budget. As a storm moves in, a likely sequence might be:

1. Observe Weather Predictions
2. Apply anti-icing chemicals
3. Observe presence of snow and ice
4. Plow to remove excessive snow
5. Continue to plow and apply chemically treated abrasives in key areas such as intersections and approaches.
6. De-ice with chemicals in key areas using care not to use chemicals where drifting snow could cause refreezing.
7. Repeat Steps 1 and 2 as well as pray for sunshine.

General Policies

- Normal snow plowing shall be conducted during daylight hours between 6:00 a.m. and 5:00 p.m., five days per week.
- Upon the discretion of the Road & Bridge Superintendent, snow plowing roads shall occur during early morning hours and/or weekends.
- The "Department" will not plow snow during high winds, unless it is an emergency.
- The "Department" will not be liable for any fence damage that occurs to fences which lie within the County's right-of-way.
- The "Department" will not be liable for any mail boxes knocked over or damaged due to snow being plowed. However, the "Department" will replace any mail boxes which are physically hit by the "Department's" snow plows.
- Paved roadways will be plowed when there is a significant accumulation of snow.
- Graveled roadways will be plowed when there is a significant accumulation of snow according to priority list.
- The "Department" will sand subdivision approaches inside the County right-of-way during emergency situations only.
- When necessary, paved roads will be sanded on regular basis at major intersections, hills, curves, etc.
- Graveled roads will be sanded only in emergency situations, or at the discretion of the Road & Bridge Superintendent.

I've been told my beautiful maple tree is too close to the county road. Why do I need to remove it?

Roadside Shoulders and Clear Zones:

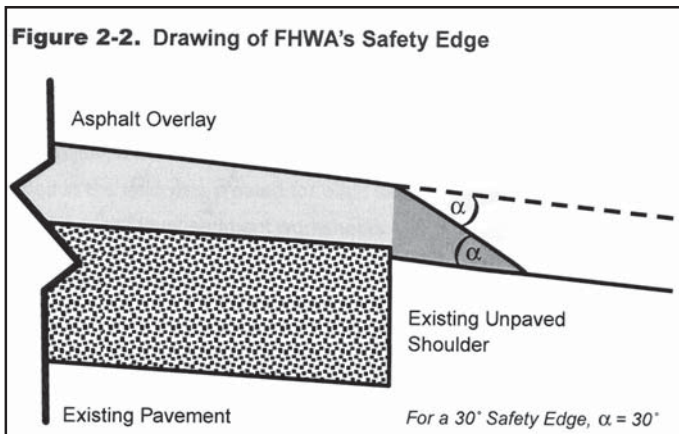
The concept of a "Forgiving Roadway" is to allow survivability of users when driver error occurs. Drivers do become distracted and vehicles do leave the roadway. The wider and smoother of a recovery area provided, the more a driver has a chance to recover. This recovery area is sometimes referred to as a clear zone. The clear zone also allows the driver to see conflicts (pedestrians, animals, other drivers, etc.) and slow down or avoid collision. The smoothness of the transition from roadway to shoulder prevents tire scrubbing and over correction which can cause roll-over as a vehicle tries to re-enter the roadway. If attended to, all of these details will provide a safer roadway and reduce liability.

The American Association of State and Highway and Transportation Officials (AASHTO) discusses clear zones (AADT <400): At locations where a clear recovery area of 6 feet or more in width can be provided at low cost and with a minimum social/environmental impacts, provisions of such a clear recovery area should be considered. Fixed objects within the clear zone that may be struck by errant vehicles which would in turn injure or kill drivers should be removed or relocated.

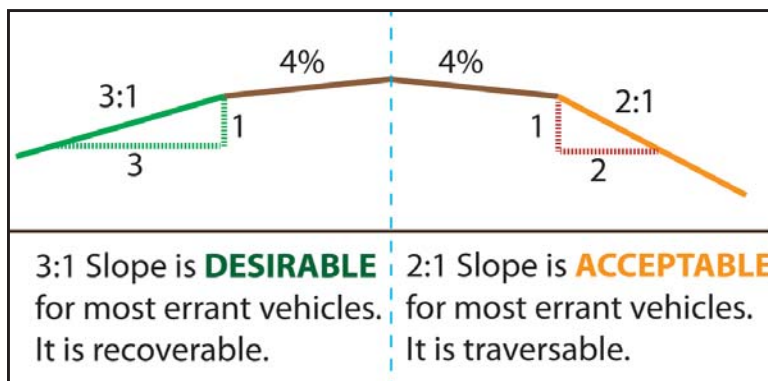
Continued on Page 4...

Communicating (Cont'd from Page 3)

The Manual on Uniform Traffic Control Devices recommends that signs be placed at least 6 feet from edge of shoulder or 12 feet from traveled way. In order for sign visibility not to be affected, brush, trees and other vegetation should be cleared when they are within 12 feet of the roadway or 6 feet from the shoulder depending on which criteria is used for sign mounting.



The safety edge between the driving surface and the softer, lower shoulder should be carefully designed when working on paved roads and maintained often when on gravel roads. Paved surfaces should provide no more than a 30 degree angle transition to the unpaved shoulder. Gravel roads should have a hinge point from the 4% cross slope to the 3:1 shoulder. In some cases the shoulders may have a 2:1 slope which would require a more gentle transition.



Interstates use a 30 feet clear zone for recovery of errant vehicles. Ten to twelve feet is recommended for lower volume roads. Six feet should be considered a minimum in areas where signs are posted at that same distance. The US Forest Service uses two feet in areas where topography limits more clear space. Each road should be considered for factors such as traffic, prevailing speed, parked vehicles, curb and gutter, fences, ditches, urban or rural, etc. before setting a clear zone. For the sake of uniformity, policies within individual jurisdictions should conform as close to possible with national standards.

If they pave our neighborhood streets, how will I be informed?

Neighborhood Paving:

When paving in a residential area, Public Service Announcements (PSA's) are very helpful so everyone is on the same page as to when it is going to start, what streets are going to be paved, and how long it will last.

Process: Public Notice

- Hand-Delivered Flyers
- Radio – PSA's
- Traffic Control – Set up day before
- Person – where work was performed
- Public Informed as work progressed
- Equipment left where it did not affect customer
- Traffic Control – Removed Immediately

The following is an example flyer of what a paving company handed out to residents prior to a residential paving project:

August 21, 2013

Somewhere Street Improvements

On Thursday, August 22, 2013, Construction Company X will begin milling driveways and subdivision approaches for the Residential Improvements project. This work will continue for approximately 4 days. If we are not on your street as stated above we will begin the following day. We will be starting paving work Wednesday or Thursday the week of August 26, 2013, weather permitting. The streets will be open to local traffic for your access. Please avoid parking in the streets on days we are working.

When paving equipment is moved into place we will be shooting oil on the street prior to beginning work. Please avoid driving in the oil!!

Please drive slowly in the area of construction. Watch for workers and follow the traffic signs!! Your help in this construction is appreciated. If you have any questions, please call xxx-xxxx. Thank you.



Communicating (Cont'd from page 4)

Why can't I put some kind of dust control product on the county road right in front of my house?

Gravel Road Stabilization:

The severity of a dust problem is determined primarily by speed of traffic on the unpaved road. The condition is then aggravated by long dry spells, softer road aggregates that wear off under traffic to produce more dust, and initial excessive soil binder in the surface mix. Without binder material and adequate moisture, the coarser material will be thrown or washed away from the road surface. The road begins to ravel, rut, and washboard. Deterioration accelerates until costly repairs are needed.

One way to correct this problem is to use dust palliatives through gravel road stabilization. Gravel road stabilization has been a solution for dust control.

Benefits of dust control include:

- reduced maintenance costs;
- reduced vehicle accidents due to improved visibility;
- reduced vehicle damage from flying objects;
- higher quality of life and property value for those living or working close to a treated road;
- reduced dust-related health problems;
- reduced impact on dust sensitive vegetation; and
- reduced complaints from the public.

The stabilizing chemicals used penetrate the road aggregates, coat the particles in it, and bind them together. This binding action keeps the road dense and compacted. The chemicals also maintain moisture in the road base to minimize the loss of fines. These chemicals are hygroscopic, i.e. they keep the surface constantly damp.

Unfortunately if only one or several residents on the county road place some kind of dust control only on their section of road, the county road department now has a "checkerboard" of various chemical dust controllers and it becomes a difficult road to maintain. One of the best solutions is to have the residents on a particular stretch of road meet with the county road department or with the county commissioners and possibly find a funding solution where all parties can pool their monies to put down the same type of stabilizer on that section of roadway. They can coordinate this effort when the county road department has a scheduled grading and shaping of that section of road so it benefits all involved.

One gravel road stabilizer that has been used in the west is Magnesium Chloride. Attributes include:

- Starts water absorption from the air at 32 % relative humidity
- More effective than calcium chloride solutions for increasing tension, resulting in a very hard road surface when dry
- Treated road can be graded again and compacted again with less concern for losing moisture and density

Some limitations are:

- Requires minimum humidity level to absorb moisture from the air
- More suitable in drier climates
- In concentrated solutions, very corrosive to steel, i.e. attracts moisture, thereby prolonging active period for corrosion
- Rainwater tends to leach out highly soluble chlorides

- If there is high percentage of minus #200 material, the surface may become slippery when first treated.
- Effectiveness when 20% solution has performance similar to water

A few basic environmental concerns:

- There is generally negligible water quality if the proper buffer zone exists between treated area and water
- Freshwater aquatic impact may develop at chloride concentrations as low as 400 ppm for trout, up to 10,000 ppm for other fish species
- Plant impacts might result for species such as pine, hemlock, poplar, ash, spruce, and maple
- There may be potential concerns with spills

There is large farm equipment going over narrow county road bridges and it has knocked off the object markers. Doesn't the county have to put bridge markers on the bridges?

Resolution for Solution:

Pondera County Road Department was having difficulty with their Type 3 Object Markers on county bridges from being damaged or torn off due to their height by large farm equipment as it traveled over small county bridges. After discussing at length possible solutions, it was determined the county road department could use Type 2 Object Markers (a shorter marker than Type 3) and their County Commissioners passed the following resolution:

Resolution - 1989- #11 - Bridge Signing

WHEREAS, Pondera County finds it impossible to maintain standard bridge markers due to destruction from moving equipment.

WHEREAS, Pondera County wishes to minimize damage to said signs. Pondera County will by authority of MUTCD 3 C-1 use Type 2 markers,

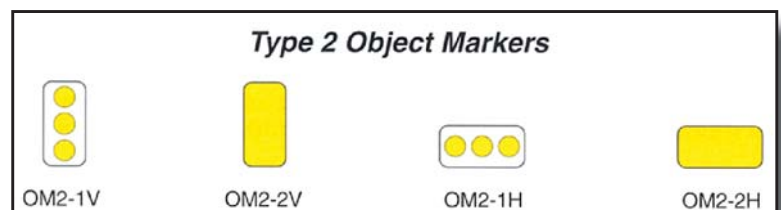
THEREFORE, be it resolved the County will mark all bridges with TYPE 2 signs mounted 6 inches above ground level on posts at end of bridge railing.

Adopted this 11th day of December, 1989.

*(Signed by Board of County Commissioners)
Pondera County, Montana*

The reference is in the Manual on Uniform Traffic Control, Chapter 3C.01 Object Marker and Placement Height:

- Type 2—either a marker (OM2-1V or OM2-1H) consisting of three yellow retroreflectors, each with a minimum diameter of 75 mm (3 in), arranged either horizontally or vertically on a white panel measuring at least 150 x 300 mm (6 x 12 in), or on an all-yellow horizontal or vertical retroreflective panel (OM2-2V or OM2-2H), measuring at least 150 x 300 mm (6 x 12 in).



Continued on Page 8...

Calendar of Events • January 2015 - June 2015

January 2015

S	M	T	W	Th	F	S
				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	31

1: New Year's Day - MT LTAP Offices Closed
 11-15: 94th Transportation Research Board, Washington, DC
 12-16: Safety Fest, FVCC, Kalispell - <http://www.safetyfestmt.com/>
 15: Work Zone Flagging - Register through the Safety Fest
 19: Martin Luther King Day - Offices Closed
 20: MT LTAP Safety Webinar-Temp. Traffic Control 7:30am-8:00am
 26-28: 12th Annual Safety Congress - Great Falls, MT (MT LTAP):
 26am: Work Zone Tech
 26pm: Traffic Control Supervisor
 27: Traffic Control Supervisor
 28: Roadway Safety Training

February 2015

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1	2	3	4	5	6	7
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12: Asphalt Institute - Helena, MT (MT LTAP)
 16: President's Day - Observed (Montana LTAP Offices Open)
 24: MT LTAP Safety Webinar - Leadership- 7:30am-8:00am

Montana LTAP
Quarterly Newsletter
Going Electronic
January 2015

March 2015

S	M	T	W	Th	F	S
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29	30	31				

9-13: MSU Spring Break
 10-12: Safety Fest, Lewistown - <http://www.safetyfestmt.com/>
 16: Work Zone Technician - Butte (MT LTAP)
 17: Work Zone Technician- Great Falls(MT LTAP)
 18: Work Zone Technician- Havre (MT LTAP)
 19: Work Zone Technician- Billings (MT LTAP)
 20: Flagging Certification Course - Billings (MT LTAP)
 23-27: National Work Zone Awareness Week (FHWA)
 24: MT LTAP Safety Webinar Slips/Trips/Falls - 7:30am-8:00am
 30 - April 2: MACRS 35th Annual Conference-
 Heritage Inn, Great Falls, MT (MT LTAP)

April 2015

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1-2: MACRS 35th Annual Conference Heritage Inn, Great Falls, MT (MT LTAP)
 12-15: APWA North American Snow Conference - Grand Rapids, MI
 More info: <http://www.apwa.net/Snow>
 21: MT LTAP Safety Webinar: Roadway Prism Design 7:30-8:00am
 19-23: NACE Annual Conference 2015, Daytona Beach, FL

SAVE THE DATES:
MACRS 2015 Spring Conference
March 30 - April 2, 2015

May 2015

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31						

6: Gravel Roads Maintenance & Design - Bozeman
 12: Work Zone Flagging Course - Miles City (MT LTAP)
 13: Work Zone Flagging Course - Glendive (MT LTAP)
 14: Work Zone Flagging Course - Wolf Point (MT LTAP)
 17-23: National Public Works Week(APWA)
 19: Gravel Roads Maintenance & Design - Baker
 20: Gravel Roads Maintenance & Design - Roundup
 25: Memorial Day - Offices Closed
 26: MT LTAP Safety Webinar: Road Stabilization/Dust 7:30-8:00am
 27: Work Zone Flagging Course - Helena (MT LTAP)

June 2015

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28	29	30				

2: Work Zone Flagging Course - Bozeman (MT LTAP)
 2-4: Safety Fest, Butte - <http://www.safetyfestmt.com/>
 3: MACRS Executive Meeting, 1-5pm - Bozeman
 4: MT LTAP Annual Advisory Board Meeting, 9am-12pm - Bozeman
 16: MT LTAP Safety Webinar - Weeds & Mowing 7:30am-8:00am

Safety Meeting Webinars from Montana LTAP

January 20, 2014: Temporary Traffic Control
 February 24, 2015: Leadership
 March 24, 2015: Slips, Trips, Falls - 3-Point Contact
 Monthly Thirty-Minute Safety Webinars held at 7:30am on Tuesday Mornings
 Call Montana LTAP at 1-800-541-6671 for more information!

Some dates and locations are subject to change.
Call Genevieve Houska, LTAP, 1-800-541-6671 to confirm.

Calendar of Events • July 2015 - December 2015

July 2015

S	M	T	W	Th	F	S
			1	2	③	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
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26	27	28	29	30	31	

4: Fourth of July Holiday - Offices Closed

14: MT LTAP Webinar: TBA-7:30-8:00am

20-23: National LTAP/TTAP Summer Conference, Savannah, Georgia

Training on Request:
Summer Survival
Hand Safety
Slips, Trips, & Falls

August 2015

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23	24	25	26	27	28	29
30	31					

18: MT LTAP Webinar: TBA - 7:30-8:00am

Training on Request:
Forklift
Sign Safety
Road Audits

September 2015

S	M	T	W	Th	F	S
		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			

2 & 3: 26th Annual Equipment Safety Training and Snow Rodeo -

Great Falls, MT (MT LTAP) Brochure available in July

7: Labor Day Holiday - Offices Closed

20-24: MACo 106th Annual Conference, Holiday Inn, Missoula, MT
www.mtcounties.org or MACo's Karen Houston 406-449-4360

22: MT LTAP Safety Webinar: TBA 7:30am-8:00am

October 2015

S	M	T	W	Th	F	S
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25	26	27	28	29	30	31

MACRS Fall District Meetings: TBA

7 - 9: 84th League of Cities & Towns - Bozeman, MT

7: Public Works Directors Meeting - Bozeman, MT

TBA: Put The Brakes On Fatalities Day - 15th Anniversary (go to: www.brakesonfatalities.org)

12: Columbus Day - Observed (Montana LTAP Offices Open)

20: MT LTAP Safety Webinar: TBA - 7:30am-8:00am

21 - 22: 30th Regional Local Road Coordinators Conference, Rapid City, SD

November 2015

S	M	T	W	Th	F	S
1	2	3	4	5	6	7
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22	23	24	25	26	27	28
29	30					

11: Veterans' Day - Offices Closed

16-20: Safety Fest, Billings - <http://www.safetyfestmt.com/>

TBA - LTAP Leadership - TBA 8am - noon

TBA - MACRS Planning Meeting, 1-5pm and 8am - noon;

25: MT LTAP Safety Webinar: TBA 7:30am - 8:00am

26 - 27: Thanksgiving Holiday - Offices Closed

Some dates and locations are subject to change.
Call Genevieve Houska, LTAP, 1-800-541-6671 to confirm.

December 2015

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	⑫	26
27	28	29	30	31		

TBA: LTAP Leadership - Miles City

15: MT LTAP Safety Webinar: 7:30am-8:00am

25: Christmas Holiday - Offices Closed

Training Opportunities at Montana LTAP Website:
<http://www.coe.montana.edu/ltapv2/training/index.html>

Communicating (Cont'd from Page 5)

After moving out to the country, I noticed drivers were yielding to approaching traffic on their right at intersections. Why doesn't the county just put up four-way stop signs?

Keys to Safer Intersections and Reduced Liability

There are several very important factors to be considered when improving intersection safety:

The decision to place a sign is that of the governing body. All the above factors should be considered when making that decision. When the decision has been made to use a sign, the MUTCD can give proper guidance as to what sign is used and how it should be placed.

In Section 2B.04 of the MUTCD, Stop and Yield signs can be used where normal right-of-way rules do not apply. If neither direction is always required to stop, a yield sign may be used to assign right-of-way different than the normal "yield to the right" rule.

On most Montana county roads a four-way stop is not warranted. Warrants to apply a four-way stop are shown in Section 2B.07 in the manual and include five or more crashes per year and volumes of over 300 vehicle per hour for an eight-hour period.

The use of Warning signs should be limited. According to the MUTCD Section 2A.04, Regulatory and Warning signs should be used conservatively because these signs, if used in excess tend to lose their effectiveness. Section 5, the Low volume road section (< 400 AADT) 5A.03 suggests that engineering judgment should be used to determine if a warning sign is to be used.

The AASHTO Geometric Design of Very Low Volume Local Roads helps us understand "Clear Sight Triangles" at intersections. Page 41 explains that if the visibility at prevailing speed doesn't allow a driver to stop to avoid a collision, something needs to be adjusted (obstacles removed or signing). Prevailing speeds at the intersection are roughly half the allowed speeds. Attentive drivers reduce speeds at intersections and look for conflict. Once stopping distance at this speed is obtained the clear triangles can be drawn.

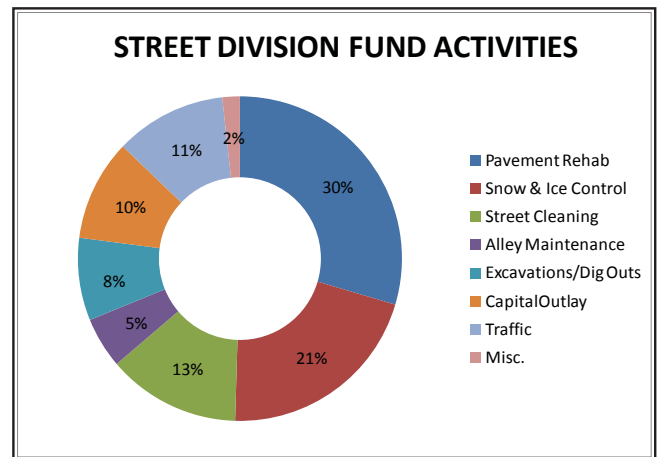
The standard of care here in Montana is to not sign rural intersections unless you observe problems associated with several of the factors first listed on this sheet. If it is felt there exists a significant risk at an intersection, a sign like Stop (R1-1) Yield (R1-2) or Intersection (W2-1) may be considered.



There seems to be lots of paving in other neighborhoods. How does the city decide where to pave next?

City of Great Falls Budget

Jim Rearden, City of Great Falls Public Works Director, recently shared how the City of Great Falls determines where their budget is allocated to street maintenance.



In 2013, his Street Division covered 102.80 blocks with a two-inch asphalt overlay, almost 8 miles. The Street Division Overlay projects took 62 days and over 15,000 tons of asphalt. They had 60 minor reconstruction projects involving asphalt patching and paving using just over 2,300 tons of asphalt. On average the Street Division does 48 blocks of overlay projects a year, almost four miles. They have a total of 3,564 blocks and cover about 1.35 percent per year (74 year rotation).

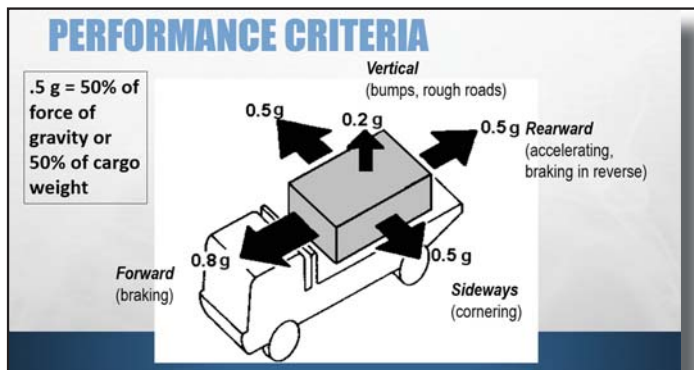


With regards to chip sealing in 2013, his Street Division chip sealed 86 blocks in eight days of work, just about 7 miles. On a daily average they chip sealed almost 11 blocks a day and on average chip seal 78 block in a year. With regards to their 3,564 blocks, they chip seal 2.1% per year (46 year rotation).

Jim Turnbow, City Street Supervisor, provided Rearden with the above figures. Rearden explained their street maintenance is funded by street assessment and the Montana Gas Tax. As asphalt costs go up, they are limited to the amount they can spend for street repairs as their budget also includes snow and ice control, street cleaning, alley maintenance, excavations/dig outs, capital outlay, traffic, and other miscellaneous transportation costs.

Load Securement Webinar Info

During Montana LTAP's recent monthly safety webinar on Load Securement, October 2014, Steve Jenkins, MT LTAP Director, lead the webinar with important procedures for load securement from the Federal Motor Carrier Safety Administration's Drivers Handbook. Doug Nisbet, Lewis & Clark County Road and Bridge Operations Superintendent, provided some key points they have set up for maintaining a safety culture around hauling equipment.



As Jenkins and Nisbet discussed the reasoning behind making sure a load is secure, the above diagram illustrated why the headache rack or cab guard needs to be strong enough to maintain the percentage of shift when braking, at 0.8g. The side to side movement created by turning a corner or going around a steep curve has 50 percent of the weight pushing against chains or straps. This is also true for acceleration or braking in reverse. The vertical pressure of 0.2g is caused by going over an incline rapidly or bouncing on rough roads.

Nisbet described an incident where a four-wheeler and large tank of weed spray were being hauled up a steep mountain pass. The liquid started to surge in the tank causing the trailer to fishtail. Unfortunately the four-wheeler was only secured with an ATV ratchet strap and bounced off the trailer onto the shoulder of the road. No one was hurt but it did cost the county nearly \$14,000 and would not have happened if the vehicle had been secured properly.

Nisbet also noted it was important to size the chain for the type of transport. Most of Nisbet's heavy equipment is tied down with 3/8" Grade 70 chains such as loaders, dozers, graders, etc. They use 5/16" Grade 70 for smaller equipment such as small skid steers. At their county shop, they inspect each chain every time it is used. Any chain that gets replaced is written in their log book. Each chain is cut to length for that specific piece of equipment.

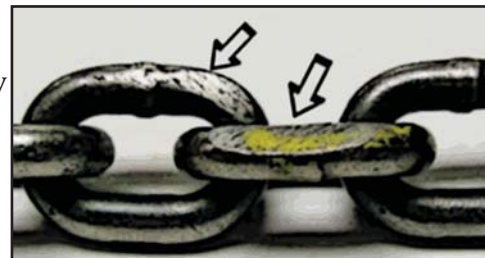
Chain Link Diameter (inches)	...Working Load Limit (Pounds)...				
	Unmarked or Grade 30	Grade 43	Grade 70	Grade 80	Grade 100
1/4	1,300	2,600	3,150	3,500	4,300
5/16	1,900	3,900	4,700	4,500	5,700
3/8	2,650	5,400	6,600	7,100	8,800
7/16	3,700	7,200	8,750not available.....	
1/2	4,500	9,200	11,300	12,000	15,000
5/8	6,900	13,000	15,800	18,100	22,600

Once a year, Nisbet's mechanic, a certified crane operator, reviews all chains to insure there are no issues and notes in this log book if a chain is replaced.



Chain stamped G70

Several years ago Nisbet said they had a tilt bed trailer where an extra eight feet of loose chain was tossed under loaded and secured equipment. As they went down the gravel road, this chain vibrated off the bed of the trailer and wrapped around the wheels which were ruined. This was a costly equipment error but fortunately nothing else happened.



Another safety procedure Nisbet uses to keep from wearing the chain links is a policy where all chains must be carried out of the box to the trailer bed. They were having issues with chain links wearing from being dragged across the asphalt surface. When inspecting any chain hooks, Nisbet said it is important to replace the hook if there is a gouge or wear-spot located on the inside of the hook.



At Lewis and Clark County Road Department, Nisbet said they use chains for all large and small equipment transport.

They use the web straps for hauling culverts or pipe which are also blocked on the trailer so when the straps are removed the culverts or pipes do not roll off the trailer bed and cause injury. Nisbet noted the greater the angle of the strap, the better the tie down securement. Straps also should have their Working Load Limit marked by the manufacturer on a label to indicate their load capacity. With regard to web straps, there are also corner protectors that can be used when tying down on sharp edges. As with any load, it is important to recheck tie downs on the load within 15 to 30 minutes after going down the road. He said it was also important to keep an eye on the load by watching your mirrors. This is especially important when hauling anything with rubber tires on a bumpy road.

Jenkins concluded webinar with importance of not going over GVWR due to brakes not working efficiently, tires losing air pressure, and springs getting stressed causing more malfunctions. To view recorded webinar in its entirety: <http://www.coe.montana.edu/ltapv2/resources/webinars/index.html>

Information for webinar also came from Purdue University, Purdue Extension PPP-75, "Securing the Load", <https://www.extension.purdue.edu/extmedia/PPP/PPP-75.pdf> and from FMCSA, Drivers Handbook, <http://www.fmcsa.dot.gov/>

Road Diets - Less is More

By: Rebecca Crowe, FHWA Office of Safety, and Heather Rigdon, Leidos

We live in a world that requires more. More highway lanes to move traffic, more bandwidth to run our computer applications, more energy to power our screens. We also live in a world where more is harmful: more people are killed in roadway crashes in the United States than most anything else, ranking in the top 15 causes of death for the past 30 years. (NHTSA, "Traffic Safety Facts Research Note: Motor Vehicle Traffic Crashes as a Leading Cause of Death in the United States, 2008 and 2009," DOT-HS-811-620 (Washington, DC: 2012). Available at: <http://www.nrd.nhtsa.dot.gov/Pubs/811620.pdf>)

Of the multiple safety treatments from which an agency can choose to address this problem, what if one of them involved not increasing but rather reducing the number of travel lanes? That solution exists, and it is called a "Road Diet."

Four-lane undivided highways have a history of relatively high crash rates as traffic volumes increase and as the inside lane is shared by higher-speed through traffic and left-turning vehicles. A classic Road Diet converts an existing four-lane undivided roadway segment to a three-lane segment consisting of two through lanes and a center two-way left turn lane (TWLTL). The configuration also provides an opportunity to allocate excess roadway width to other purposes, including bicycle lanes, on-street parking, or transit stops.

A Road Diet can improve safety and provide important benefits including:

- Reduced overall crashes (typically 19 to 47 percent).
- Reduced rear-end and left-turn crashes through the use of a dedicated left-turn lane.
- Reduced number of lanes for pedestrians to cross.
- Reduced right-angle crashes as side street motorists must cross only three lanes of traffic instead of four.
- Improved traffic calming and reduced speed differential, which can decrease the potential for crashes and reduce the severity of crashes if they occur.
- Simplified road scanning and gap selection for motorists (especially older and younger drivers) making left turns from or onto the mainline.



The Road Diet configuration also offers a number of quality-of-life improvements, offering transportation planners the opportunity to:

- Install pedestrian refuge islands.
- Install bicycle lanes when the cross-section width is reallocated.
- Allocate the "leftover" roadway width for other purposes, such as on-street parking or transit stops.
- Support a more community-focused, "Complete Streets" environment.

The table below shows problems may be correctable by Road Diet implementation.

Category	Problem	Rationale
Safety	Rear-end crashes with left-turning traffic due to speed discrepancies	Removing stopped vehicles attempting to turn left from the through lane could reduce rear-end crashes
	Sideswipe crashes due to lane changes	Eliminating the need to change lanes reduces sideswipe crashes
	Left-turn crashes due to negative offset left turns from the inside lanes.	Eliminating the negative offset between opposing left-turn vehicles and increasing available sight distance can reduce left-turn crashes
	Bicycle and pedestrian crashes	Bicycle lanes separate bicycles from traffic; pedestrians have fewer lanes to cross and can use a refuge area, if provided
Operational	Delays associated with left-turning traffic	Separating left-turning traffic has been shown to reduce delays at signalized intersections
	Side street delays at unsignalized intersections	Side-street traffic requires shorter gaps to complete movements due to the consolidation of left turns into one lane
	Bicycle delays	Potential for including a bike lane eliminates such delays
Other	Bicycle and pedestrian accommodation due to lack of facilities	Opportunity to provide appropriate or required facilities, increasing accessibility to non-motorized users
	Aesthetics	Provisions can be made for traversable medians and other treatments
	Traffic calming	Potential for more uniform speeds; opportunity to encourage pedestrian activity

Source: N. Stamatiadis, A. Kirk, C. Wang, A. Cull, and N. Agarwal, Guidelines for Road Diet Conversions, KTC-11-19/SPR-415-11-1F (University of Kentucky, Kentucky Transportation Center: 2011). Available at: <http://www.ktc.uky.edu/projects/guidelines-for-road-diet-conversions/>

A Few Winter Safety Quick Tips

Winter Driving - What's in Your Emergency Kit?

- Cell phone or two-way radio
- Windshield ice scraper
- Snow brush
- Shovel
- Tow Chain
- Flashlight with extra batteries
- Traction aids (bag of sand or cat litter)
- Blankets, Change of Clothes (Wool Hat/Gloves/Scarf/Coat)
- Emergency Flares
- Jumper Cables
- Snacks
- Water
- Road Maps

Hypothermia:

It occurs when the normal body temperature (98.6°F) drops to less than 95°F. Exposure to cold temperatures causes the body to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. Symptoms include uncontrollable shivering. Moderate to severe symptoms include loss of coordination, confusion, slurred speech, heart rate/breathing slow, unconsciousness and possibly death.

- Call 911 immediately in an emergency
- Move worker to warm, dry area
- Remove any wet clothing and replace with dry clothing.
- Wrap the entire body (including the head and neck) in layers of blankets; and with a vapor barrier (e.g. tarp, et.) DO NOT COVER FACE.

Handy Manual for Winter:

Minnesota Snow and Ice Control, Field Handbook for Snowplow Operators at this link:

http://www.mnltap.umn.edu/publications/handbooks/documents/snice_2012_wb.pdf

Road Diets (Cont'd from Page 10)

A Road Diet can be a low-cost safety solution, particularly in cases where only pavement marking modifications are required to make the traffic control change. In other cases, the Road Diet may be planned in conjunction with reconstruction or simple overlay projects, and the change in cross section allocation can be incorporated at no additional cost.

Geometric and operational design features should be considered during the design of a Road Diet. Intersection turn lanes, traffic volume, signing, pavement markings, driveway density, transit routes and stops, and pedestrian and bicyclist facilities should be carefully considered and appropriately applied during the reconfiguration for appropriate Road Diet implementation.

As with any roadway treatment, data analysis and engineering judgment are required to determine whether a Road Diet is the most appropriate alternative in a given situation.

The new publication includes safety, operational, and quality of life considerations from research and practice, and it will guide readers through the decision-making process to determine if Road Diets are a good fit for a certain corridor. It also provides design guidance and encourages post-implementation evaluation. The guide is available here: http://safety.fhwa.dot.gov/road_diets/info_guide/. For more information, contact Becky Crowe at Rebecca.Crowe@dot.gov

If medical help is more than 30 minutes away:

Give warm sweetened drinks if alert (NO Alcohol), to help increase the body temperature. Never try to give liquids to an unconscious person.

•Place warm bottles or hot packs in armpits, sides of chest, and groin. Call 911 for additional rewarming instructions.

Note: Rewarming too rapidly can cause the victim to have circulatory problems, resulting in heart failure.

Information from OSHA website:

https://www.osha.gov/dts/weather/winter_weather/index.html#coldstress



Montana LTAP Library

Welcome to the LTAP Lending Library where publications, videos, DVD's, and software may be borrowed for a two-week period. We have a limit of three videotapes or DVD's for a rent-free two-week period. Some publications are free or for a nominal charge upon request.

For information or checkout procedures, please call Genevieve Albert or Michele Beck, LTAP, 1-800-541-6671. If you have computer access, please e-mail us: [mtltap\(at\)coe.montana.edu](mailto:mtltap(at)coe.montana.edu).

We have new lists for the library publications, software, DVD's, and videos at our web site, just click on Resources: <http://www.coe.montana.edu/ltapv2/> (Note: Many of our publications are electronically available.)

At this web site, you can also keep track of upcoming workshops, past and present newsletters, and workshop announcements.

Our 2014-2015 Needs Assessment Survey is available at this web site. Thank you in advance for taking time to complete it.

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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•Present and past issues are available at <http://www.coe.montana.edu/ltapv2/newsletter/index.html> or by calling 1-800-541-6671.

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•LTAP attempts to provide accommodations for any known disability that may interfere with a person participating in any service, program or activity. Alternative accessible formats of this document will be provided upon request.

•Please send us any comments or concerns you may have regarding this newsletter with your name and address in order that we may respond in a timely manner.



Parting Shot . . .

In order to share their wisdom, this special column is dedicated to those who are retiring, or recently retired, and wish to pass on some gems from their years dealing with county roads or city streets. The following comments are from retired Chouteau County Road Supervisor Russ Albers:

Immediately after college, I started working as a laborer for the Montana Department of Highways, later to become known as Montana Department of Transportation, MDT. I eventually became the field supervisor out of Fort Benton.

I participated as one of five state employees appointed to develop the first MDT Statewide Equipment and Safety Training program. We developed protocol for snowplow operations and safety, truck driver training, backhoe and motor patrol training and safety and equipment maintenance.

In 1993 I was honored to be asked by MDT Division Chief to represent them at the 4th Annual APWA Snow Rodeo and Equipment Safety event held in Great Falls. I placed second in the Motor Grader competition.

After twenty-two years I left MDT and began working for Chouteau County as Road Supervisor and never looked back. During my eighteen years as County Road Supervisor, I learned to listen to the community and considered them as my eyes and ears. After all, one person cannot drive every road every day and do a good job.



I realized the need to partner with the public and listen to their concerns, then do the best possible job I could for Chouteau County.

I feel privileged to have acted in many roles, from Montana Association of County Road Supervisors (MACRS) District #3 Representative during 2000 to 2003 and as MACRS President from 2004 to 2005. I also valued the opportunity to have served as a member of the LTAP (Local Technical Assistance Program) Advisory Committee.

I gained an enormous amount of knowledge working with LTAP and attending various training seminars. Networking with a statewide pool of road supervisors, commissioners, vendors, MACRS members and MACo (Montana Association of Counties) members was priceless for me.

I feel very fortunate to have had the opportunity to meet and get acquainted through working alongside so many knowledgeable people.

It has been my privilege to work for the people of Chouteau County. I take pride in a job well done and treasure the lifelong friendships I have made along the way.

I especially want to take this opportunity to thank my wife, Paulette, for all the years of support and bologna sandwiches....with mustard.

If asked would I do it again....."absolutely yes"!

Russ Albers