T² Roads on the Range

2015

ISSUE 1

The 2015 annual Transportation and Safety Congress

The 20th Annual Transportation and Safety Congress started with opening remarks from the Wyoming T²/LTAP Center. The five arms of the Wyoming T²/ LTAP Center were presented including: safety studies, asset management, traffic studies, loan programs, and training.

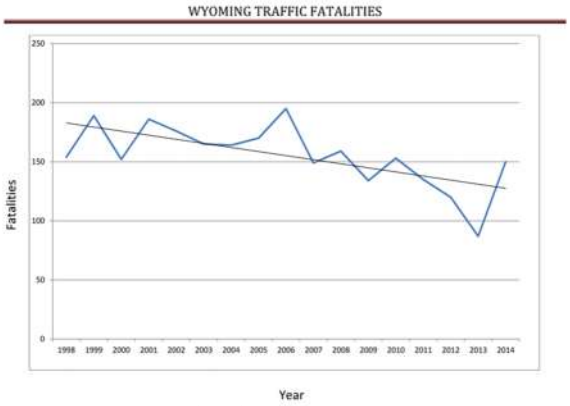

Figure 1. Number of Fatalities in Wyoming in the Last 16 Years.

Joe Dailey, the FHWA Wyoming division administrator, spoke next about the recent Wyoming traffic fatality numbers as shown in Figure 1. There was an increase of over 50 fatalities from 2013 to 2014 but the overall trend for the last 16 year has been on a downward trend. Every fatality affects so many people in all aspects of life.

John Radosevich talked next about the Wyoming Association of County Engineer and Road Superintendents (WACERS). He emphasized that WACERS is always trying to get more involvement from all the counties.

Road Scholars "Class of 2015" was presented with five participants earning their road scholars as shown in Figure 2 (see page 2). Being recognized as a Roads Scholar requires the successful completion of at least twelve (12) Wyoming Technology Transfer Center workshops. Of these, one must be the Annual Transportation and Safety Congress and one must be Work Zone Traffic Control. Recognition as a Master Roads Scholar requires the successful completion of at least twenty (20) Wyoming Technology Transfer Center workshops, with the same two required workshops as for Roads Scholar recognition.

Tom Mason the Director for the Cheyenne Metropolitan Planning Organization (MPO) presented next on developing a strategic highway safety plan for the Cheyenne MPO. The Cheyenne MPO has taken a leadership role as one of the first MPOs in the country to develop a Transportation Safety Management Plan (TSMP). To develop the TSMP, the Cheyenne MPO convened a Transportation Safety Advisory Committee (TSAC) comprised of individuals with knowledge and involvement in the 4 E's of safety: enforcement, education, engineering, and emergency medical services. To guide the TSMP, the Committee developed a mission and goal.

Using regional crash data, the group identified the specific transportation safety problems that posed the greatest threat and those with the greatest opportunity for improvement in greater Cheyenne. Based on the data review, the following six emphasis areas were identified: Impaired Driving; Distracted Drivers; Intersections and Other Hazardous Locations; Occupant Protection; Older Drivers; and Younger Drivers.

Wyoming Technology Transfer Center

WY T² LTAP

Local Technical Assistance Program

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Khaled Ksaibati gave a presentation about developing a strategic highway safety plan for the Wind River Indian Reservation. That presentation was followed with a discussion about the potential of developing safety plans for counties.

Pavement Management System (PMS) breakout session

Bernie Kuta from FHWA started this breakout session with providing the overall benefits of having a Pavement Management System (PMS). PMS helps find the most cost effective strategies and help in justifying funding requests. Andy Freeman, the Statewide PMS engineer, explained how the data collected by WYDOT is very similar to what was collected for the counties. Counties do have an edge with the Ground Penetrating Radar (GPR) data and WYDOT has to do core analysis when determining pavement depth. Khaled Ksaibati gave a summary of all the county data collected in the summer/fall of 2014. This included the average pavement conditions as well as the pavement and base thicknesses for all the county paved roads statewide. A comprehensive report for Park County was then presented that showed how the data can be packaged.

The PMS session ended with a Panel Discussion that included: Kevin Geis from Campbell County, Bernie Kuta from FHWA, Andy Freeman from WYDOT, Khaled Ksaibati from Wyoming T²/LTAP Center. Kevin Geis talked about how Campbell County has used PMS data for rehabilitation strategies and how the data can be used for funding. The open discussion centered on how the data can be packaged for county use as well as for a statewide system.

Figure 2: 2015 Road Scholars. From left to right. Kent Smith, Rebel Mclean, Tommy Scott, Morgan Ellsbury, Georg Demarce, and Khaled Ksaibati.

Chris Chamberlin, a graduate assistant working with the Wyoming T²/LTAP Center, provided information on the CMAQ Dust Evaluation Study. He started the presentation with background on chemical treatments for dust control and on the CMAQ program. This summer, data collection is going to commence to determine the cost effectiveness of various chemical treatments.

Mixed Topics Breakout Session

Mark Lebelle from Asphalt System, Inc gave a presentation on products for maintaining pavement. The first product reviewed was GSB-88® as shown in Figure 3. A single application of GSB-88® lasts up to five years, extending pavement life and delaying expensive resurfacing projects. GSB-88® rejuvenates asphalt pavements by reintroducing oils and resins lost to UV rays, oxidization, temperature swings and precipitation.

Morgan Ellsbury from Crook County spoke next about alternatives to culverts. The

Figure 3. GSB-88® Applied on a Residential Street.

The 2015 annual Transportation and Safety Congress, *Continued*

2012 spring flood was the fourth time a road crossing was destroyed since 1995. Additional pipes and larger diameters were added after each failure. In 2008, Crook County spent $200,000 in employee time, equipment time, fuel, gravel and miscellaneous supplies to replace this one crossing after a flood. Typically, the 3 eight foot barrels could handle the water but the debris were the main culprit for failure since the Beaver Creek drainage is 93 square miles of heavily forested, semi mountainous terrain. Crook County was under a Presidential Disaster declaration due to numerous washouts throughout the county but FEMA would only pay to get the assets back to their original, pre-disaster condition. Crook County applied for a mitigation grant to improve this crossing.

Figure 5. New Bridge over a Problematic Area

Crook County selected a new design because the initial cost estimate was favorable to increase flow capacity for the least amount of cost. The initial cost estimate was $330,000.

PROs

- Uses natural streambed.
- Solid concrete construction
- Maintenance Free
- Passes large debris
- Very low risk of failure

CONs

- Labor intensive to construct

Crook County was approved for the funding and construction began in January 2013. The project ended up being double the initial estimate due to an engineering error with bedrock elevations, which when discovered, called for a complete foundation redesign. The new design concept shown in Figure 5 will be used at more problematic locations in the county.

Colonel Mark Trostel gave a presentation on impaired driving with alcohol and marijuana. He went over the states statutes for a wide range of issues. He talked about the importance of having a policy in place for when transgressions occur. The effects that Marijuana has on driving and the Colorado experience was presented next. There isn't enough data yet to determine the effect this has had on the safety of Colorado's roads but the national highway traffic safety administration (NHTSA) found that marijuana users are 25% more likely to involved in a crash than non-users. Figure 6 shows a participant with goggles that reduce visibility to simulate a drunk driver experience.

Figure 6. Goggles that Simulate a Drunk Driver Experience.

Will Grimes from the Western Research Institute presented on a forensic investigation of two chip seal failures in 2011 near medicine bow, WY on U.S. Highway 287/30. The following 7 questions should be considered when determining the success of the chip seal:

1. Did the emulsion residue re-emulsify?
2. Was there too much dust on the chip seal aggregate?
3. Were the aggregate and emulsion incompatible?
4. Was there a problem with the aggregate and emulsion spread rates?

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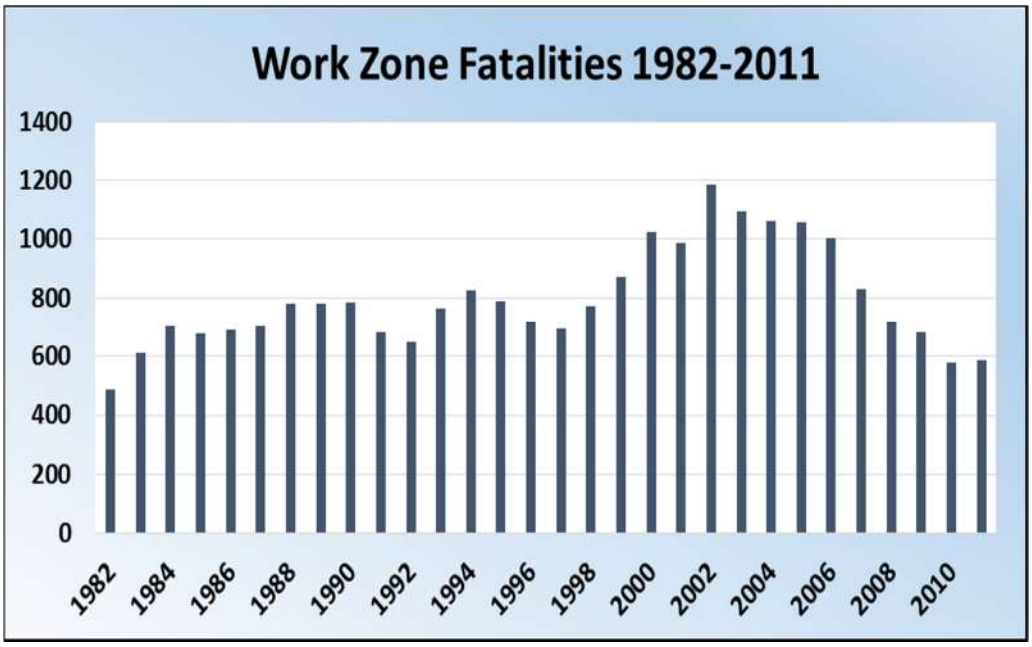
Work Zone Safety and ATSSA Flagging Certification

As everyone knows, there are two Seasons in Wyoming, winter and CONSTRUCTUION Season and it is CONSTRUCTION Season which means that our roadways are full with Work Zones. Anyone who works on roads or streets should have a basic understanding of the principles of work zone traffic control. Do your job duties require flagging or have the potential to require flagging in the future? If so, a certification maybe required. The WYT2/LTAP Center offers several workshops around the state throughout the year on work zone safety/temporary traffic control and American Traffic Services Association (ATSSA) Flagging Certification. The curriculum is a two part workshop, which is completed by attending a morning session and an afternoon session. The first session is work zone safety and traffic control while the second session is ATSSA Flagger Certification. The purpose of flagging certification and temporary traffic control, as well as the principles for their use, is to promote highway safety and efficiency by providing for the orderly movement of all road users on streets and all public roads throughout the nation.

The first session of the workshop covers the elements of work zones/temporary traffic control; component parts of a temporary traffic control zone, set up, maintenance, types, and take down. This session of the workshop is traditionally held in the morning and is a three hour course. It helps you improve your understanding of work zone operations, associated risks and how to make work zones safe. It also covers the Manual on Uniform Traffic Control Devices (MUTCD) to select an appropriate layout, along with the procedures that should be followed to make sure the work zone is safe.

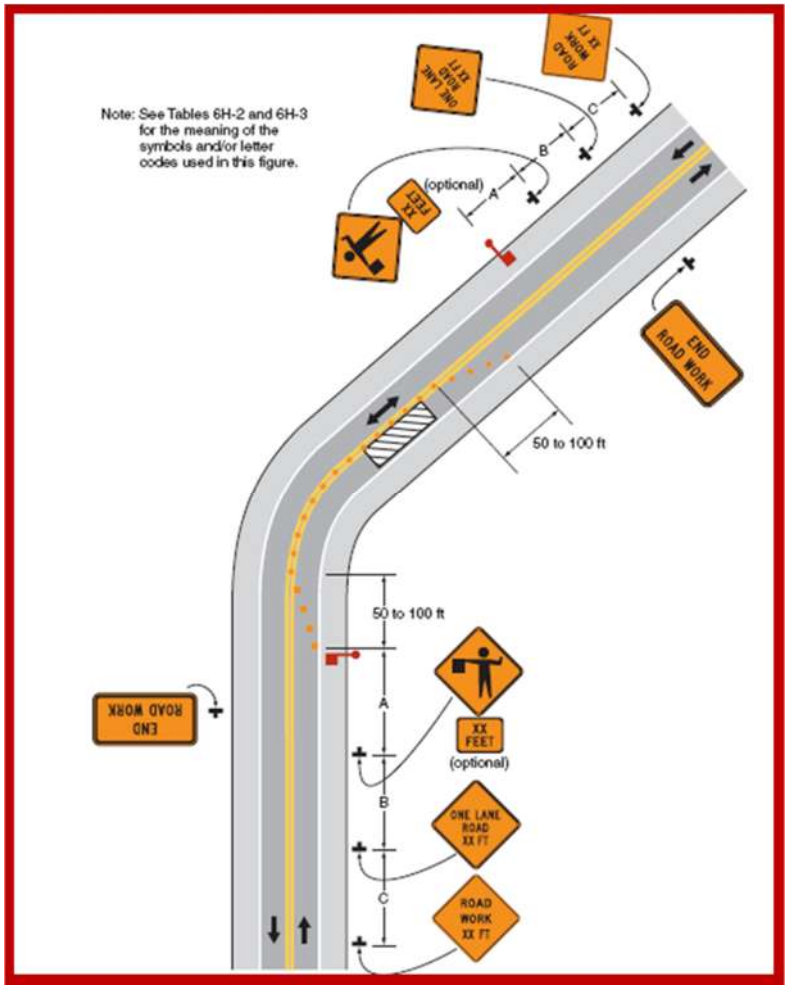


Work Zone Fatalities, 1982-2011
Source: Fatality Analysis and Reporting system (FARS)

Work Zone Safety and ATSSA Flagging Certification, *continued*

The second session of the workshop is the ATSSA Flagging Certification Course. This session is traditionally held in the afternoon and is a three hour course. It is specifically for those who will be flaggers. Those who assume the duties of flagger must understand their role in the work zone and know how to perform their job safely and effectively. The course describes why proper flagger operations are important, the abilities of a good flagger, how to use standard references as they pertain to flagger control, the proper flagging signals and procedures, and the different flagging practices for various typical situations. This workshop also covers the MUTCD.

To become certified as an ATSSA flagger, you need to attend both sessions of the workshops, pass a 25 question flagger EXAM, pass a demonstration test, and comply with all requirements of the ATSSA flagger program. Wyoming flagging certification is valid for three years. Bart Evans is a certified instructor and Josh Jones is on his way to become certified. Please feel free to contact us at the center if you have any questions about this training. - *Bart Evans, safety analyst*



Gravel Road Management: The Most Important Issues

At the Road Dust Best Management Practices Conference on February 3, South Dakota LTAP program manager and gravel road expert Ken Skorseth outlined an effective gravel road management strategy. First, he recommended three publications:

Special Report, 1992-96; Unsurfaced Road Maintenance Management (U.S. Army Corps of Engineers)

Pavement Surface Evaluation and Rating (PASER) (University of Wisconsin)

Rural Road Condition Survey Guide (South Dakota DOT)

Then he discussed the most important issues for gravel road maintenance.

Loose aggregate

"If you have as much as two to four inches of loose aggregate," Skorseth said, "it can cause drivers to lose control of their vehicles. It also leads to corrugation, more dust, and maybe potholes if there are also geometric problems. What may look like a rutting problem is probably a loose aggregate problem. If you shovel off the loose aggregate, you'll often find that the underlying road surface is almost a perfect A-shaped crown. And you can't tell gravel depth through the windshield! You have to dig. You can do it with an auger on a skid loader. But you need to auger quite a few holes because the gravel depth will vary, and that means the regraveling operation should not always be a uniform layer."

Incorrect motor grader operation

Geometric problems, usually caused by incorrect motor grader operation, are another fundamental issue, Skorseth said. "If we don't get the basic geometry correct—particularly a 4 percent crown—nothing else will work. To really know, place an electronic level on your vehicle's dashboard and drive the road."

Poor gravel quality

"We get a lot of complaints about roughness," Skorseth said, "and that usually means corrugation, too much loose aggregate, or sometimes potholes, all of which can be caused by poor gravel quality. To determine gravel quality, the first challenge is to get representative samples. You can get surface samples with a spade bit on an impact hammer. Put a mark on the bit at 3 inches and carefully chop out a test pit. You need to gather several samples because quality will vary. If an auger is used, remove the pilot bit. If you get just a little bit of the subgrade soil in your sample, it changes the plasticity and the overall gradation."

	Substandard Uncompacted	Substandard Compacted	Barely Meets SDDOT Spec Uncompacted	Barely Meets SDDOT Spec Compacted	Modified SDDOT Spec
Loose gravel (tons/mile)	185	150	100	110	16
Corrugation (inches in height)	≤1 (2 days after blading and 3 inches of rain)	≤1 (2 days after blading and 3 inches of rain)	None	None	None
Roadway surface width (feet; all built 21½ feet)	26	26	24	24	22
Rutting	≤1	≤1	None	None	None

Testing gravel quality at three sites

Skorseth described a test conducted in South Dakota: "In 2011, we built three sections in different parts of the state, all 21½ feet wide. In each place, we built sections with three types of gravel:

Gravel Road Management: The Most Important Issues, *continued*

- Substandard—meets no spec except top size (one inch minus)
- Barely meets SDDOT Gravel Surfacing Spec—per-cent passing #200 sieve is low and/or plasticity
- Modified SDDOT Spec—minimum 10% passing #200 sieve; minimum PI = 7

"The substandard and 'barely-meets' types were built with both compacted and uncompacted sections," Skorseth explained. "Each section was built as in a good regravel project, with three or four inches of new gravel after the existing surface was prepared and shaped."

He said it was hard to find gravel meeting the modified SDDOT specification (minimum PI = 7): "Natural glacial gravel tends to be clean with a low percentage of fines, and the fines that are there are non-plastic. We couldn't get gravel that met the spec in two of the three sites so we had to add clay. You have to get the clay very dry or it's hard to blend."

Table 1 gives results from tests conducted in 2013 at one of the three locations, near Brookings, SD, which has annualized ADT of 100. Skorseth said the most interesting fact so far is that the Modified section needed only one blading in 2013 while the sub-standard sections needed up to four bladings.

—Richard L. Kronick, LTAP freelancer, article credits belong to Minnesota LTAP, University of Minnesota.

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5. Was there insufficient polymer, or was it improperly applied?
6. Could excess petroleum distillate (solvent) have been used to formulate the emulsion?
7. Was the base asphalt used to formulate the emulsion too soft?

Josh Jones from the Wyoming T²/LTAP Center gave an overview of the sign reflectivity maintenance standards and the five different methods for a sign management program.

Wade Porter from Caterpillar presented on new safety and operating features for the new motor graders. One of the models he overviewed was the new CAT M Series 3 Motor graders as shown in Figure 7. The new model offers greater fuel efficiency, more operator comfort and safety features, as well as enhanced serviceability.

Matt Carlson from WYDOT provided an update on the statewide sign program as well as on other safety issues. The 2015 sign program will deliver 804 wooden posts, 452 tubular steel posts with anchors, 9,410 square feet of aluminum sign panels and 1,735 total signs. For the 13 participating counties, the signs will be delivered to each county shop by August 1st, 2015. Let the Wyoming T²/LTAP Center know when the signs are installed so that they can be inspected.

Thanks for all the participants and speakers for the 20th Annual Transportation and Safety Congress. We look forward to seeing you all again next year.

Figure 7. CAT M Series 3 Motor Graders.

- Josh Jones, Traffic Engineer

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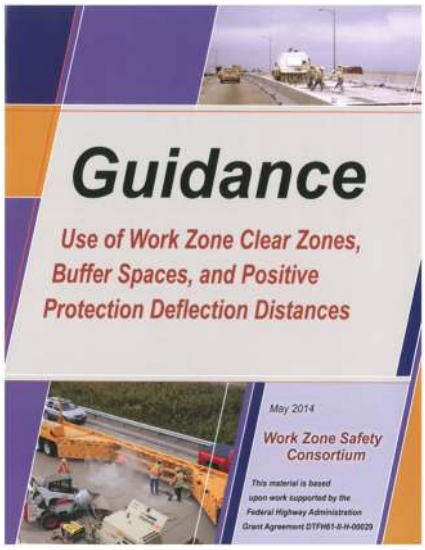
Return Service Requested

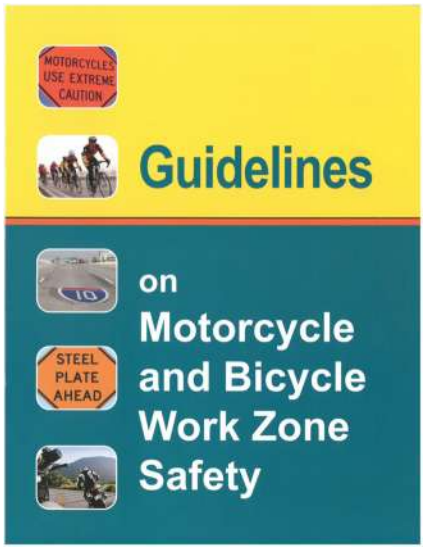
Work Zone Resources On The Web

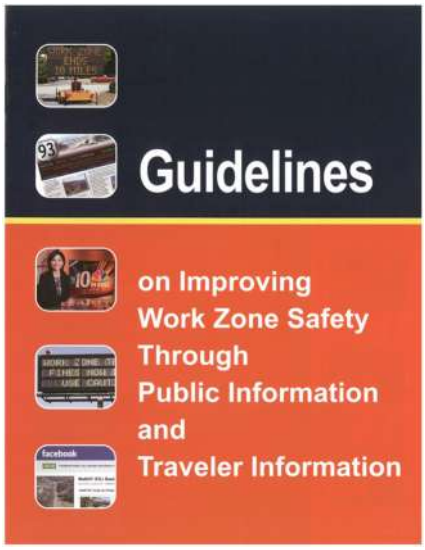
You can download several documents which provide guidelines on different topics covering work zones such as: clear zones, buffer spaces, and positive deflection distances and improving work zone safety through public information and traveler information. Guidelines on motorcycle and bicycle work Zone safety is also available at the following web site: **http://www.workzonesafety.org.**

The T2 Web site includes information on OSHA related topics under resources. **http://www.uwyo.edu/wyt2/resources/**

-Bart Evans, safety analyst







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