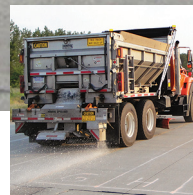


LOCAL TECHNICAL ASSISTANCE PROGRAM



Winter 2014

In This Issue

Meet the LTAP Advisory Board	2
Follow LTAP on Twitter	2
How Truck Speed and Distribution Method Influence Salt Bounce and Scatter	3
Winter Tire Tips & Passenger Chain Laws	4
Benefit-Cost Analysis of Fixed Automated Spray Technology (FAST)	4
Winter Maintenance Resources	5
Culvert Installation and Maintenance	7
Fall 2014 Training Graduates	7
2015 STIC Innovation Funding Available	8
Ideas That Work: El Paso County Tumbleweed Eater	9
2015 Spring Street Conference	11
Upcoming LTAP Training	12



<http://ltap.colorado.edu/>

Culvert Installation and Maintenance ONLINE TRAINING FOR LOCAL AGENCIES

The Minnesota LTAP has collaborated to develop an online training course for students to learn about the purpose of well-designed, well-built, and well-maintained culverts. This Culvert Installation and Maintenance course highlights the important role culverts play in the drainage system and why proper design, installation, and maintenance are essential for well-performing culverts. The course provides students with a basic understanding of the principles of culvert theory, design, location, planning, scheduling, permitting, and typical installations. It also outlines culvert inventory, inspection, repair, and rehabilitation methods.

This online distance-learning course was created in an effort to help local agencies provide training for their staff in a more cost-effective manner. The online curriculum is similar to our traditional classroom training but perfect for students who are unable to travel or prefer a “work at your own pace” environment. Students are free to access the course anytime and anywhere within a five-month time frame.

The course is made up of six lessons, each containing a narrated presentation, video clips, reading, opportunities to check your understanding, and a quiz.

Why Take Online Training?

- Learn at your own pace—any time, any place,
- Reduce travel costs,
- Become familiar with online learning formats,
- Learn to use the computer for other education purposes, and
- *Roads Scholar I Credit!*

....continued on page 7

The Colorado LTAP Advisory Board

VOTING MEMBERS:

DOYLE VILLERS
LA PLATA COUNTY

KEVIN SCOTT
PHILLIPS COUNTY

MARLENE CROSBY
GUNNISON COUNTY

TAMMIE CRAWFORD
PARK COUNTY

CONNIE EDELEN
ARAPAHOE COUNTY

DARREN GARCIA
OTERO COUNTY

JOHN (JP) POLHEMUS
SUMMIT COUNTY

ROB MCARTHUR
DOUGLAS COUNTY

JOHN BAKER
TOWN OF SNOWMASS VILLAGE

DAVID VIALPANDO
CDOT ALAMOSA

JIM HATHEWAY
STANTEC

NON-VOTING MEMBERS:

BILL HAAS & RICK SANTOS
FHWA MANAGERS

AMANULLAH MOMMANDI
CDOT MANAGER

STEVE MARKOVETZ
CDOT LOCAL PROGRAMS

RENÉE RAILSBACK
COLORADO LTAP

In the fall of 1986, the Colorado LTAP Advisory Board was established to create better communication between LTAP staff and the local agencies it serves. The Board is made up of elected city, county, local and DOT representatives from various agencies throughout the state. There are currently 11 *voting* members and 5 *non-voting* members participating on the board; members are not paid for their participation. The board members provide input and feedback on strategic planning and program goals throughout the year. Colorado LTAP staff and program sponsors meet with the Advisory Board four times per year – February, June, September and November. The intent of the board is to evaluate the performance of the program and offer suggestions “from the field” on providing the best services possible for local transportation agencies in Colorado. What are hot topics for city and county employees that the Newsletter should address? What special training programs are needed? How can the free lending library better serve local agencies? The board also discusses potential areas for greater participant involvement and how to increase the overall cost-benefit of the program services.

The Colorado LTAP Advisory Board met on February 27th at the FHWA Division Headquarters in Lakewood, CO. Topics discussed at recent LTAP Board meetings have included: future status of program sponsorship and staffing, training program updates, technology transfer and innovation funding, local agency resources, safety improvement opportunities under the new Strategic Highway Safety Plan, Street Conference planning, Every Day Counts initiatives, and more.

Colorado LTAP would like to thank our Advisory Board members for their dedication and service on the board. The LTAP staff greatly appreciate all the members have done to promote and strengthen the program. Their experience and knowledge have been extremely valuable through the years.

COLORADO LTAP

Renée Railsback
Program Director

Cassandra Guild
Technical Assistance and
Customized Training

Becky Miller
Webmaster

The Local Technical Assistance Program (LTAP) is sponsored by the Federal Highway Administration, the Colorado Department of Transportation, and the University of Colorado at Boulder to provide information on the latest transportation issues facing Colorado's state and local governments.

For more information:

Colorado LTAP

University of Colorado
Boulder
UCB 561
3100 Marine St, A213
Boulder, CO 80309

Office: (303) 735-3530

Toll Free: (888) 848-LTAP

Fax: (303) 735-2968

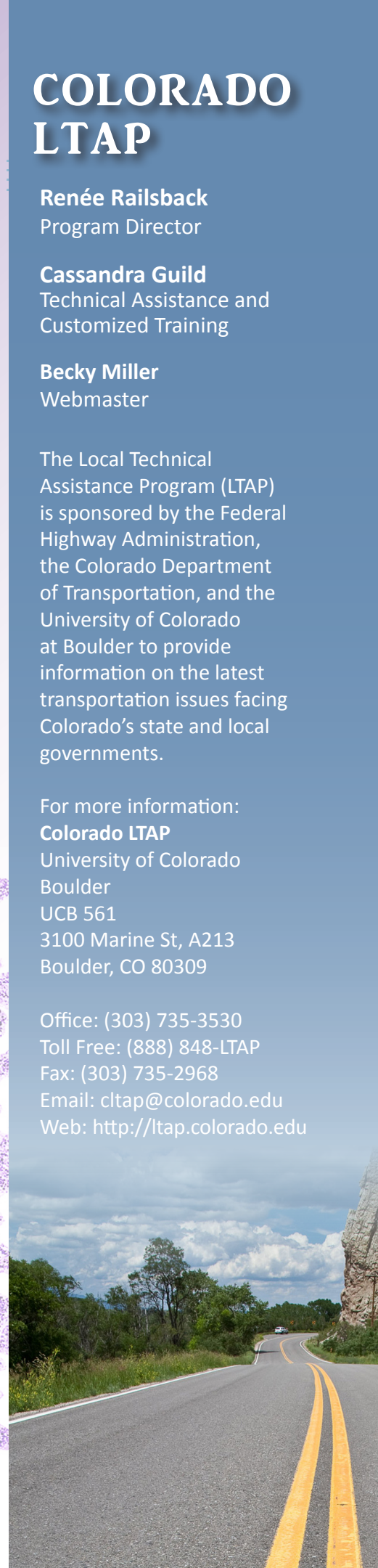
Email: cltap@colorado.edu

Web: <http://ltap.colorado.edu>



Follow [Colorado_LTAP](#) on [twitter](#)

Receive event updates and webinar announcements.





How Truck Speed and Distribution Method Influence Salt Bounce and Scatter

Shaughn Kern, Technical Writer and Alexander Slepak, Technical Writing Intern, MI LTAP/Center for Technology & Training

Thousands of years ago, salt was prized for its ability to preserve food; it was also sown into the soil of enemy lands by invading armies to make the soil unsuitable for agriculture. Whether our ancestors understood the science of soil salinity is debatable, but they did have one thing in common with today's winter maintenance professionals: they knew the value of salt as a resource, and they appreciated the environmental damage salt could cause if misused.

According to a study conducted by the Michigan Department of Transportation (MDOT) in the early 1970s, 30% of dry salt used on roads is lost immediately to bounce and scatter. The study concluded that pre-wetting the salt before spreading it reduced bounce and scatter by improving the application pattern and accelerating the melt-rate. Today, pre-wetting has become commonplace and is recognized by state and local transportation agencies as a significant cost-saving measure. However, further research was necessary to determine the influence of other distribution variables on the effectiveness of salt.

Building on Past Experience

In the summer of 2012, the MDOT Operations Field Services Division built on the research from the 1970s, with the goal of determining an optimum vehicle speed and distribution method for applying salt. MDOT's Operations Field Services Division provides training and support for maintenance garages that are responsible for summer and winter maintenance on state trunk lines.

The new study reexamined the effectiveness of salt treated with a liquid chloride solution, and correlated it to truck speed and salt distribution systems. The comparison of two salt types (untreated and treated), three truck speeds (25, 35, and 45 mph) and two distribution systems (Y-chute and cross-conveyor) made for a total of twelve tests. To conduct the tests, MDOT staff laid out a grid on a 100-foot stretch of unused freeway in Southwest Michigan. This location made for an ideal test site where traffic would not disturb the salt or create a dangerous situation for the staff conducting the tests.

The test grid was made up of 12 four-foot lanes, which simulated a two-lane road with 12-foot paved shoulders. Trucks driving in the left travel lane dropped salt into the "target area," which spanned four feet on each side of the centerline. The amount of salt recovered from the target area and each four-foot grid lane was tabulated as a percentage of the total amount of salt that was dropped.

Special attention was paid to salt recovered in the target zone and the rest of the travel lane, since only salt in the travel lane is considered effective. Over the course of the entire study, salt recovered in the travel lane ranged from 95.3% to 35.7%, depending on the speed of the truck, distribution system used, and whether the salt was treated or untreated. As expected, the results of treated vs. untreated salt verified those found 40 years ago: treated salt performed significantly better at all speeds and through all distribution systems. The comparison between cross-conveyor and y-chute systems resulted in slightly better performance for the conveyor type. For untreated salt, 9% more stayed in the travel lane when distributed through a conveyor; with treated salt, 13% more stayed in the travel lane.

Speed Increases Bounce and Scatter

Regardless of salt type or delivery system, truck speed had the most profound effect on how much salt was lost to bounce and scatter. The most effective method of spreading salt on roads, a truck driving at 25 mph spreading treated salt with a conveyor, lost only 9% to bounce and scatter. The same test at 35 mph resulted in 32% loss, with 45 mph showing a 45% loss. The table below shows the projected cost associated with the salt loss at each speed (based on the seasonal cost of salt in Southwest region of Michigan.)

Speed	Percent Wasted	Projected Cost
25 mph	9 %	\$ 355,080
35 mph	32 %	\$1,247,400
45 mph	45 %	\$ 1,762,200

The main recommendation from this study, the complete results of which are available in a project summary report that MDOT published in November 2012, is crystal clear. According to the report, "The most effective scenario ... occurs when a treated salt product is applied with a cross conveyor from a truck traveling at 25 mph. Conversely, salt bounce and scatter is at its highest when applied from a Y-chute delivery system in a truck traveling at 45 mph." The full Bounce and Scatter Summary Report is available at: www.MichiganLTAP.org/DeicingStudy.

...continued on page 6

Winter Tire Tips and Chain Laws for Drivers

EQUIP YOUR CAR WITH SAFE WINTER TIRES

Bald or worn tires cannot grip the road and can be extremely hazardous – think of tires as your lifeline in a car; the few square inches of rubber contacting the pavement is all that is between you and potential trouble.

- In one day last winter, CDOT assisted 22 vehicles that spun out and blocked traffic or caused an accident – 19 out of those 22 had bald tires.

WANT TO KNOW IF YOU NEED NEW TIRES? TAKE THE QUARTER TEST!

Insert a quarter into the tire tread upside down, with Washington's head going in first. If the top of George's head is covered by the tread, your tires are OK – do this test at multiple points around each tire. If the top of his head is visible at any point around the tire, you need new tires.

FOLLOW COLORADO'S CHAIN LAWS

When a Chain Law is in effect for passenger vehicles under 26,000 gross vehicle weight, you *must* have:

- Snow tires with minimum 1/8" tread, or
- All weather tires with mud and snow (M/S) mark with 1/8" tread, or
- 4-wheel drive with 1/8" tread tires, or
- Traction device (chains, auto-sock, etc.)

Signage along the highway will alert drivers when a Chain Law is in effect.



Benefit-Cost Analysis of CDOT Fixed Automated Spray Technology (FAST) Systems

The Colorado Department of Transportation (CDOT) evaluated *Fixed Automated Spray Technology* systems used to supplement winter maintenance operations through both national and CDOT surveys, safety analysis, and benefit-cost analysis. The Western Transportation Institute (WTI) conducted the research on behalf of CDOT to study the cost effectiveness of existing CDOT FAST systems.



The study found that FAST systems have demonstrated the potential to reduce the number of crashes and reduce the cost of winter maintenance activities, if sited at appropriate locations (e.g., high-traffic-volume ice-prone ramps). The 14 systems in the analysis were found to reduce the number of crashes on multilane rural highways by 2%, urban interstates by 16 - 70%, rural interstates by 31 - 57%, and interchange ramps by 19 - 40%. Overall, the CDOT FAST systems have reduced crash severities at many sites resulting in a potential safety benefit of \$196,428 per winter season during the “after deployment” study period. A benefit-cost excel spreadsheet was also developed based on the estimated crash reductions observed for each of the different roadway types.

Improved installation techniques and involvement of maintenance crews during FAST installation are necessary to further increase the cost-effectiveness of a FAST system deployment. The full report is available on CDOT's website at: <https://www.codot.gov/programs/research/pdfs/2014/>.

CO Passenger Vehicle Chain Laws & Winter Driving

Throughout the winter, Colorado State Patrol (CSP) will be increasing chain law enforcement for truckers, *as well as passenger vehicles*.

Did You Know?

Colorado's Chain Laws also apply to *passenger vehicles*. When conditions get bad enough, a passenger vehicle chain law can come into effect. CDOT and CSP will alert motorists about an active Chain Law through roadside signage, but motorists should always be prepared by keeping traction devices like chains or alternative traction devices in their trunk.

I-70 motorists also have access to a new source of real time traffic information – a live audio stream on Saturday and Sunday mornings and afternoons during the peak traffic times available through CoTrip.org and the [CDOT Mobile](#) app. These two apps offer the most up-to-date, accurate road conditions and travel information. Additional winter driving tips can also be found online at <http://www.coloradodot.info/travel/winter-driving>.



Online Winter Maintenance Resources

Winter is finally here, but as many know, winter in Colorado is unpredictable. When you're not plowing immense amounts of snow, you can prepare by familiarizing yourself with some best practices for winter operations. Below are a few of the numerous online resources for forecasting, plowing, deicing, salt use, and workforce management. We hope that these resources will help guide you through a safer and easier winter season.

An electronic copy of this article with hyperlinks to these resources is available on the Colorado LTAP website: <http://ltap.colorado.edu/>.

FORECASTING & RESPONDING

[CoTrip.org](#) and the [CDOT Mobile app](#) offer the most up-to-date, accurate road conditions, live cameras, and traveler information.

[Best Practices for Road Weather Management, V. 3.0](#)

FHWA updated this guide to capture state-of-the-art road weather management strategies employed in response to environmental threats. The guide contains 27 case studies of systems in 22 states that improve roadway operations under inclement weather conditions. Each case study includes a general description of the system, system components, operational procedures, resulting transportation outcomes, implementation issues, as well as contact information and references.

[The National Center for Atmospheric Research](#)

Located in Boulder, CO, the Center allows you to view real-time weather data including satellite, radar, surface and air temperatures, and forecasts.

[@ColoradoDOT](#)

CDOT's primary Twitter account frequently contains information on severe weather events.

MATERIALS & EQUIPMENT

[Strategies to Mitigate the Impacts of Chloride Roadway Deicers on the Natural Environment](#)

(2013) NCHRP Synthesis 449 provides proactive and reactive mitigation strategies as well as new technologies for ice removal.

[Clear Roads Cost-Benefit Toolkit](#)

This web-based toolkit takes the guesswork out of evaluating winter maintenance investments by facilitating cost-benefit analyses for 21 different winter maintenance materials, equipment and methods. There are also training materials and a user's manual to get you started.

[Salt Institute Road Publications](#)

Lists the Salt Institute's snow fighting handbooks, publications, and newsletters on winter operations, focusing on effective and safe salt use.

[An Experimental Study on the Effectiveness of Anti-icing Operations for Snow and Ice Control of Parking Lots and Sidewalks](#)

(2013) This report investigates studies done to assess the effectiveness of anti-icing. It considers operational decisions related to anti-icing strategies including its relative effectiveness under different weather and site conditions, treatment options, and optimal application rates.

....continued on page 6

Salt Bounce and Scatter, *continued from page 3....*

Less Salt is Better

Reduction of salt waste has benefits beyond cost savings. Salt causes deterioration of the road, corrosion of the vehicles travelling on it, and it can negatively affect roadside vegetation. Further, effective salt use can limit the need for abrasives such as cinders and sand, for which cleanup costs can be significant.

The report called for further testing using other delivery systems such as zero velocity spreaders (which eject salt in a way that compensates for truck speed), salt slurry generators, and a variety of y-chute heights. MDOT recently ran a second phase of testing to cover these additional variables.

Phase 2: Dialing it in

In the second phase of testing, which was conducted during the summer of 2013 at the same site as the first phase, MDOT Roadway Operations Engineer Justin Droste established a simplified method of quantifying results. “Instead of reporting results in graphical form organized by grid lane, we combined all grid lane values into a single point value for each test,” Droste explained. “The single point value provided a simple overall assessment, which enabled us to compare test results more easily.”

Results indicated that the most effective methodology was to spread salt from a zero-velocity system at 25 mph, with an effectiveness score of 0.93 on a scale of 0.00 to 1.00. Even at 35 mph, the zero-velocity system had an

effectiveness score of 0.82, which was better than all other systems running at 25 mph. Notably, when accelerated to 45 mph, the effectiveness of the zero-velocity system dropped to two-thirds of the score at 25 mph.

In Conclusion

Based on results from the two phases of the study, MDOT released a Maintenance Advisory to update statewide deicing practices. The advisory specifies a maximum speed of 25 mph while applying deicing material. Justified exceptions to the practice include: peak hours on high-speed routes; using zero-velocity spreaders, slurry generators, or other technology that limits salt scatter; or other circumstances approved by the region engineer. The advisory also recommends 7 to 10 gallons of liquid per ton of dry salt. If you are interested in reviewing MDOT’s Maintenance Advisory, it is available for download at www.MichiganLTAP.org/MA2013-01.

Tim Croze, region support engineer of the MDOT Operations Field Services Division, is pleased with what his team learned from the study. “It’s nice to assign actual effectiveness numbers to the many different options we have for spreading salt,” he said. “The right combination of salt type, distribution system, and truck speed will enable us to minimize salt waste by keeping more of it in the travel lane.”

Reprinted with permission, MI LTAP Bridge, Vol. 27.3.

Online Winter Maintenance Resources

continued from page 5....

[Impacts of Using Salt and Salt Brine for Roadway Deicing](#)

(2014) While the use of salt and salt brines can help keep roads free of snow and ice and improve safety and mobility, questions have been raised about the corrosive effects they have on vehicles, their environmental impacts, and their contribution to wildlife-vehicle collisions. Idaho DOT performed a review of literature and state practices to better understand these potential impacts and used the findings to inform future practices in winter highway operations.

[Lessons Learned from Extreme Winter Events DVD](#)

This DVD will discuss actions taken such as implementing new programs (anti-icing, pre-wetting, contracting etc.) and looking for best practices (new routes, using liquids, new equipment). Loan it from the LTAP Library (DVD40 LLEWE).

PLOWING

[Repurposing Truck Tires](#)

(2013) This innovative solution provides instructions on how to utilize old truck tires as wing plow cutting edges.

WORKFORCE

[Winter Storms: The Deceptive Killers](#)

This preparedness guide explains the dangers of winter weather and suggests life-saving action you can take - recognize winter weather threats, develop an action plan and be ready when severe winter weather threatens. It addresses types of snow, winter flooding, wind chill effects, winter storm hazards and developing a family disaster plan.

[Reduce the Risk of Drowsy Driving](#)

(2011) Illustrates the risks of extended driving schedules during winter maintenance, and outlines ways to prevent workers from driving while tired.

[Winter Driving Safety for School Bus Drivers DVD](#)

All bus drivers must know how to maintain control of their bus during winter driving conditions and driving on snow or ice requires a skill set that every school bus driver must have. Students must also understand that riding a bus in winter brings a completely different set of circumstances they must be knowledgeable about. Loan it from the LTAP Library (DVD50 WDSSBD).

Culvert Installation and Maintenance ONLINE TRAINING FOR LOCAL AGENCIES

continued from page 1.....



Photo courtesy of David Gonzalez, MnDOT

Activities will engage students and test their knowledge. The course was designed to help students succeed. One way we accomplish this goal is by allowing students to take the quizzes and final test as many times as necessary until they understand the curriculum. Students may repeat the lesson or parts of the lesson and then test themselves again. Test questions change with each attempt. All reading assignments are available

online within the course, so no additional books or materials need to be purchased. Videos and resources will also be provided.

TOPICS COVERED

- Introduction to culverts: principles and basic understanding
- Culvert theory
- Culvert installation planning
- Common culvert installations
- Trenchless installation
- Repair and rehabilitation methods
- Inventory, inspection, and maintenance

Who Should Take This Course?

This course was developed for technicians, supervisors, and engineers who regularly work with culverts. It is geared toward individuals who install and maintain culverts as well as those who perform simple designs.

Cost: \$65 per person (\$75 to register for *Continuing Education Credit*)

Registration includes step-by-step instructions.

<http://www.mnltap.umn.edu/training/topic/drainage/onlineculvert/>

All Colorado participants will earn 1.0 Elective credit in the *Roads Scholar I* program. This course may also qualify for Continuing Education Credit.

For more information about this online course, please contact Kylie Bivins at the MN LTAP center, bivins@umn.edu or 612-625-5608.

This course was created in collaboration by the Minnesota LTAP, the Center for Transportation Studies, MN Local Road Research Board, and the MN DOT. Curriculum for this workshop was developed and compiled by BARR Engineering. Contributing agencies to technical content include ADS (Advanced Drainage Systems); American Concrete Pipe Association; JS Kruger Consulting; MN DOT.

FALL 2014 GRADUATES

We'd like to commend our recent program graduates on their commitment to maintaining the state's road system and their dedication to excellence illustrated by the graduates' commitment to professional development. Congratulations to the two new *Road Masters!*

ROADS SCHOLAR I

Brian Stone

City of Arvada

Bob Olds

City & County of Broomfield

Steve Dalke

Douglas County

Robert Evans

El Paso County

John A. Montoya

El Paso County

Scott Darker

El Paso County

Jerry Hicks

El Paso County

Martin Schmidt

Gunnison County

Dean Nachtigal

Mesa County

Jarrod Houck

Mesa County

Mike Grundy

Mesa County

Rob Wells

Mesa County

Kris Vondy

Town of Milliken

Larry Cave

Montrose County

Craig Priller

City of Northglenn

ROADS SCHOLAR II

Dan Goin

Garfield County

Brett Bowles

Town of Silverthorne

SUPERVISORY SKILLS

Dave Gonzales

City of Thornton

The Colorado State Transportation Innovation Council (STIC) has received an additional \$100,000 in 2015 to promote the rapid implementation of innovative processes and technologies to transportation stakeholders. Proposals are encouraged to address a wide range of activities pertaining to sharing innovation including: providing training or other deployment efforts; conducting internal assessments and improvements; developing guidance, standards or specifications; implementing system process changes; organizing peer exchanges; or offsetting technology implementation costs. The STIC is soliciting *your* innovative proposals that are ready to implement. The **2015 Innovation Proposal Application** is posted on CDOT's STIC website, and the deadline for submissions is **May 4, 2015**. You can search "STIC" at <https://www.codot.gov/> for details.

The Innovation Application will ask you to address the following areas, where applicable.

- Proposal summary and budget outline
- Benefit from this innovation
- Readiness of implementation
- Costs that you are seeking to offset
- Safety & mobility
- Ease of implementation and usefulness
- Operational or process efficiencies
- Workforce development

Project work can be completed by a contractor, but applications *must* be submitted by a public sector organization such as a city, county, tribal, state or federal government agency operating in Colorado. Contact Gary Vansuch, CDOT Process Improvement, at 303-757-9017, Gary.VanSuch@state.co.us for more details.

2014 WINNING PROJECTS

Three projects were selected to be funded in 2014:

CDOT Re-Vegetation Project **\$50,000**

- Development and implementation of a Revegetation Training Program designed to help accelerate the revegetation and reclamation processes and streamline stormwater permitting.

City of Centennial ITS Plan **\$30,000**

- Development of an Intelligent Transportation Systems (ITS) Plan to improve efficiency of traffic signal systems for the 11 jurisdictions in the area.

Everyday Lean Ideas Project **\$20,000**

- Education and outreach to local transportation agencies on the innovations currently available under CDOT's Everyday Lean Innovations & Ideas program.

EVERYDAY LEAN INNOVATIONS

We would like your help in disseminating the great ideas and techniques currently available in the *Everyday Lean Innovations & Ideas* program. We are looking for agencies interested in engaging employees in making their agency better. The program's website, which can be accessed at <http://www.coloradodot.info>, currently lists over 65 process improvement techniques that can be easily implemented by many agencies now.

Encouraging Innovation, a research report available on the site, identifies 34 devices designed to improve the safety, efficiency, and quality of transportation work. It includes a series of documents detailing 23 of the 34 devices including: Device Costs and Benefits, User Manual, Mechanical Drawing Package, and Preliminary Patentability Assessment. Another resource, the *Manager's Quick Start Guide for Engaging Employees Through "Everyday Ideas"*, provides guidance on how to go about engaging your employees to implement new ideas, including several activities you can start today!

NEED SUPPORT TO IMPLEMENT THESE NEW INNOVATIONS?

As part of the STIC Everyday Lean Ideas Project, funding is available to help local agencies implement these improvements within their organizations. If your agency has chosen one of the technologies or process improvements but may need help with implementation, contact Gary Vansuch, CDOT Director of Process Improvement, at 303-757-9017 or Gary.VanSuch@state.co.us for more details.

EL PASO COUNTY TUMBLEWEED EATER

2014 You Show Us Contest State Runner-Up

PROBLEM

2013 was an extraordinary year for an abundant growth of tumbleweeds in the southeastern portion of El Paso County causing road closures and road hazards, and subjecting the motoring public to piles of weeds on the roadway. The weeds needed to be removed off the roadway to eliminate the hazard.

EVOLVING METHODS

Initially, El Paso County had a dedicated crew to do tumbleweed removal almost daily for seven months. The County experimented with construction equipment, snow removal equipment and mowing equipment. They tried crushing, grading, chopping, and blowing the tumbleweeds out of the Right-of-Way (ROW), each with mixed results. Each iteration showed improved productivity; but still not completely effective. A crew of 6-8 employees plus up to 6 pieces of equipment were needed to pull tumbleweeds out of the ditch, mow them, and then blade the debris back into the ditch. This process kept road surfaces clear, but ditch lines remained full.

The old process cost, Nov 2013 – April 2014, was \$264,000; mostly sunk into labor and equipment. They continued to research better methods, and became aware of Crowley County's effort to modify farm equipment. County staff visited with Crowley County and learned lessons from their operation.

NEW SOLUTION

El Paso County began a regional search for a used forage harvester; and obtained advanced approval from the El Paso County Board of Commissioners to purchase equipment not to exceed \$50,000. They located a 1995 John Deere 6910 Forage Harvester at a farm implement dealer in Kansas.

Immediately, the employees' ingenuity transformed the Forage Harvester into a Tumbleweed Eater. Fleet mechanics, welders and equipment operators collaborated on a design to draw the tumbleweeds into the machine and finely chop them. >>>



TUMBLEWEED EATER SOLUTION, continued...

El Paso County spent six weeks mounting the grain head reel, adding hydraulics and cooling from parts on-hand, and fixing various mechanical and safety items. As the equipment is utilized, experience will guide any future modifications to the machines and methods.

TOTAL COST

The crew includes the Tumbleweed Eater and skid steer loader with grapple attachment; other crew and equipment returned to normal seasonal priorities. The County purchased the machine with a hay head, used grain head reel, and delivery for \$46,000. The total labor and parts cost to modify the Tumbleweed Eater amounted to \$40,000. The total purchase cost plus modifications and repairs to become fully operational totaled \$86,000.

SAVINGS AND BENEFIT TO AGENCY

El Paso County enhanced safety for the motoring public with an effective tool to remove tumbleweeds from the roads. They increased efficiency while motor graders and mowing equipment returned to other priorities. They reduced crew size and the number of assets and equipment required to complete the job. The crew size was reduced by 5-6 operators; and they reduced the pieces of equipment used by 4.

El Paso County experienced a successful collaborative effort between fleet and highway departments. The Tumbleweed Eater should prove to be a cost effective solution to battle tumbleweeds for many years to come. They are thankful to Crowley County for their cooperation and give credit for their development efforts and for providing a starting point in the equipment development.

If you're interested in developing one of your own - El Paso County documented development of the process on Video through the County's Public Information Office. You can search *El Paso County Tumbleweed Machine* on Youtube, or use http://youtu.be/9cDYCqOmIVs?list=UU_rkmrgBnMU9BrAbRWrnThg.

CONTACT: Troy Wiitala, El Paso County Highway Manager; 719-520-7835; TroyWiitala@elpasoco.com



SPRING STREET CONFERENCE



April 22-24, 2015



Clarion Inn

755 Horizon Dr ♦ Grand Junction, CO ♦ (970) 243-6790

\$79 room rate

ATTENDEES \$95 before April 10th

The West Slope branch of Colorado APWA and the Colorado Association for Roadway MAintenance (CARMA) present the 28th Annual Spring Street Conference. Always an educational and enjoyable event - so plan to join us! Early registration is **\$95 before April 10th**. Registration is \$110 after that date. Cancellations must be received by April 17th for a refund. Please register online where you can pay by Check or Credit Card.

EXHIBITORS \$300 before April 10th

3 *Great Ways to Participate:* 1. *Purchase an Exhibit Space* - A 6-ft table/chairs, Thursday lunch for 2 reps AND two 10'x20' outdoor equipment spaces are included with exhibitor registration. Additional outdoor spaces are \$50 each. 2. *Sponsor a Break* - At \$500, your company's name will be announced and prominently displayed. 3. *Sponsor a Hole at the Golf Tournament* - You could sponsor a hole or prizes for Longest Drive, Closest to Pin, or Longest Putt for \$150 each. Prize donations are also accepted (golf balls, tees, putters, etc.)

AGENDA TOPICS *Keynote: Wind & Pyramids: Relevance to Modern Road Construction*

CERTIFICATIONS: Emergency Management:

- Nat'l Incident Management System (NIMS-700)
- Incident Command for Public Works (ICS-100-PW)

DATA DRIVEN DECISIONS SERIES:

- Part 1: Pavement Evaluation
- Part 2: Local Road Safety Programs
- Part 3: Budget Preparation

OTHER TOPICS:

- Public Works Role in Emergency Response
- Successful Leadership: What You Do Makes a Difference
- Asphalt & Concrete Training Opportunities
- ADA Compliance
- Drainage Structure Maintenance Options
- Accident Investigation
- CDL Rules and Regulations

Tuesday, April 21st

GOLF TOURNAMENT Tiara Rado Golf Course

\$75 per person includes cart

2057 South Broadway ♦ Grand Junction, CO

Register online at <http://Colorado.APWA.net>



LOCAL TECHNICAL ASSISTANCE PROGRAM

University of Colorado Boulder
UCB 561
3100 Marine St, A213
Boulder, CO 80309-0561

Nonprofit Org.
U.S. Postage
PAID
Boulder, CO
Permit No. 156

Upcoming LTAP Training

For more information or to register online, please visit:
<http://ltap.colorado.edu>

RS I: Signing, Pavement Markings, MUTCD	March 23, 25, 26
RS I: Roadway Safety & WZ Traffic Control	March 31, April 2, 6, 10
RS I: Forklift Competency Certification	April 13, 28, May 4, 6, 7
RS I: Sign Inventory Management	May 11, 12, 18, 19
RS II: Stabilization of Unpaved Roads	March 30, April 7, 9
RS II: Confined Space Entry	April 27, 29, 30
RS II: How to Make Things Happen and Conflict Resolution	April 20 (20th on FR & WS)
SSDP: Verbal Communications	April 7
SSDP: Dealing with People	April 8
SSDP: Modern Day Ethics for Supervisors	April 23
Workshop: Flagger Certification	April 14, 15, 27, May 12

