Country Roads & City Streets

WV Local Technical Assistance Program

Winter 2007 *College of Engineering & Mineral Resources* *Vol. 22 No. 4*

Winter Road Maintenance

Improving Safety While Minimizing Environmental Impacts

By Michigan DOT Stormwater Management Team and its consultant, Tetra Tech

Will you be ready this winter to effectively fight snowstorms and transform black ice into safe driving conditions for your community? Here are some guidelines from Michigan DOT's Maintenance Division and Storm Water Management Team to help you win the battle, while also protecting valuable water resources. Keep in mind, there are many variables to consider when creating a winter road maintenance strategy, including environmental impacts, pre-season planning, execution and post-season maintenance.

Before the Winter Season

There are many actions you can take to prepare for the winter season. Planning ahead and organizing your resources, including personnel and equipment, is crucial for success.

Know Your Routes

Before the winter season, it is important to identify environmentally-sensitive areas so you can reduce chemical use in those areas. One tactic is to reduce the percentage of salt in salt/sand blends in sensitive areas.

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http://wvltap.wvu.edu

In This Issue

Country Roads and City Streets is a quarterly publication of the West Virginia Local Technical Assistance Program (WV LTAP). The purpose of this newsletter is to provide information that is beneficial to roadway construction and maintenance personnel.

The material and opinions contained in this newsletter are those of the West Virginia Local Technical Assistance Program and do not necessarily reflect the views of the Federal Highway Administration or the WV Department of Transportation. Material contained in *Country Roads and City Streets* is a combination of original and borrowed material. Every effort has been made to ensure the integrity and accuracy of this material. However, the West Virginia LTAP does not assume responsibility for any incorrect material.

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Equipment

It is impossible to fight snow storms without good equipment. Properly managed, the right equipment can increase the effectiveness of snow removal and reduce road salt usage. Before winter, inspect and repair all snow plows, spreaders and controls, and loaders. Pre-order spare parts, especially if parts are not locally available. Calibrate spreaders and spray-nozzles to ensure the right amount of materials are used. Salt trucks should ideally be equipped with ground speed control that can regulate a consistent flow of material. Consider equipping your trucks with global position satellite (GPS) systems which can monitor and track the route, road temperature, truck speed, and rate and time of chemical application. Also set up stations for emergency repair and refueling.

Salt Storage and Handling

Many environmental problems associated with road salt result from improper storage and handling. Salt needs to be covered, preferably in a building, or if not feasible, under a waterproof covering. The salt should be stored on an impermeable pad, such as asphalt. If concrete is used, it must be high quality, air-entrained and treated with sealers to reduce chloride penetration. The storage pad should slope to let water drain away, with runoff discharging into detention ponds or sanitary sewer systems. Preferably, loading, dumping, and vehicle washing should be done inside the shed and each facility should have a Pollution Incident Prevention Plan (PIPP) to address accidental spills.

Snow Disposal Sites

Suitable sites for snow disposal should be established prior to the winter season. Keeping snow disposal sites away from water bodies or away from direct discharges to water bodies should be considered. Local regulations, policies, and guidelines for water quality protection should be taken into consideration.

Communication

Communication is crucial when combating snow and ice. Having a pre-established plan and communication network can help operations run smoothly. Key components of proper communication include a storm warning system, maintenance crew radio communication, coordination with police and other public agencies, appropriate training, and good record keeping.

During the Winter Season

Gathering Information and Developing a Plan

To effectively tackle the elements, it is important to monitor meteorological conditions, including air temperature, humidity, dew point, precipitation type, wind and pavement conditions and temperature. Road Weather Information Systems (RWIS), originally developed by the Strategic Highway Research Program (SHRP) unit of the National Research Council, can communicate all of this information as it is happening. Operators can make an informed decision about when to use preventive anti-icing chemicals, which chemicals to use, when to plow, when to apply dry or liquid de-icers, when to apply abrasives such as sand, and what application rates are needed.

Anti-icing Chemicals — Yes or No?

Anti-icing chemicals should not be applied if the pavement temperature is below 15°F and the snow is light and blowing. Chemicals should be applied when the temperature is suitable for them to act rapidly, usually above 23°F. However, if forecasts are predicting the temperature will rise

to above 35°F in the next few days, chemicals should not be applied, otherwise the road surface might become slippery.

Chemical Selection

De-icing chemicals are applied to roads after ice has already formed on the surface. The de-icer lowers the temperature at which water freezes, causing the ice to melt. Anti-icing chemicals work on the same principle; however, anti-icers are applied prior to snowfall to prevent snow and ice from bonding to the pavement.

Anti-icing techniques are generally more effective and require less volume of chemical spray because it is easier to prevent a road-ice bond from forming than it is to break that bond. Sodium chloride (rock salt) is an effective, low-cost chemical for anti-icing. However, other more expensive chemicals, including calcium chloride, magnesium chloride, carbohydrate-based solutions (corn or beet byproducts), calcium magnesium acetate (CMA), and potassium acetate, may be less damaging in environmentally sensitive areas.

When to Apply Dry or Liquid Chemicals

Chemicals can be applied as liquid, dry solids, or pre-wetted solids. Liquid chemicals are most effective as pre-treatment before the storm starts or in its early stages. If applied too late, the solution may become diluted and less effective. Dry solid chemicals should be applied after the road has been plowed or during freezing rain. If ambient moisture conditions are low, pre-wetting is recommended. Pre-wetting dry salt can increase its effectiveness. The salt uses moisture to begin the ice-melting chemical reaction. The combination of brine and salt works faster than salt alone. Unlike granular de-icers, which tend to bounce off surfaces, pre-wetted de-icers stick to the road surface and can be applied at a lower rate than dry chemicals.

Equipment Washing

It is important to clean equipment after each storm to minimize corrosion. Spreaders should be swept before washing to remove residual solids and excess materials should be re-used. Washing should be done indoors and wash water should pass through oil/grit separators to remove contaminants. Treated wash water can be re-used for brine production.

After the Winter Season

Snow Disposal Site Decommissioning

Before "closing the dump" for the season, the site should be remediated and decontaminated, per local regulations.

Record Keeping and Reporting

To comply with National Pollutant Discharge Elimination System (NPDES) Phase II permits, Municipal Separate Storm Sewer Systems (MS4) communities are required to track and report to the Michigan Department of Environmental Quality (MDEQ) salt, sand, and chemical applications, both in terms of hours spent and quantity used. This not only increases awareness and decreases environmental impacts, but also is invaluable information for planning the next season ahead.

This information originally appeared in **The Bridge**, *the newsletter from the Michigan LTAP Center. The article has been reproduced with permission and has been adapted for our audience.*

This topic was discussed at the WV LTAP Snow and Ice Control Workshop this fall.

WV LTAP Hosts 16th Annual Snow and Ice Conrol Workshop

by Weslie Boyd

The Sixteenth Annual Snow and Ice Control Workshop brought record attendance this year. Held October 17, 2007 at Jackson's Mill, 133 participants learned about topics ranging from communications issues to the latest snow fighting technologies.

The morning began with a presentation by Bill Rumble, assistant public works director of Morgantown, W.Va. "How Do I Respond? Keeping Your Community Informed" provided participants with tips on how to communicate information about snow and ice control policies to the public.

WV LTAP Director Ron Eck led the next session, "Good Housekeeping: How Your Job Affects the World You Live In."

Participants learned about the effects of improper salt storage and applications, as well as tips for ensuring environmental compliance when maintaining and cleaning snow fighting equipment.

The following session, "Getting the Most out of Your Snow Fighting Materials" by Lee Thorne, maintenance engineer of West Virginia Department of Highways—District 5, provided attendees with data, facts, and tips on how to maximize available anti-icing and de-icing materials.

Participants enjoyed the panel discussion and outdoor demonstration, "Brine: Natural v. Manufactured," presented by City of Morgantown Public Works Director and City Engineer Terry Hough, Cargill Representatives Tony Dipietro and Chet Womack, and City of Fairmont Public Works Director Joe Feltz. The session explained the materials, equipment, and techniques needed to create and use salt products. The panel also discussed the pros and cons of salt brine. Participants were able to experience a hands-on demonstration of an automated brine maker after the discussion.

Exhibits of state-of-the-art snowfighting tools were onhand for the record number of participants.

Anthony Ford, WV LTAP program coordinator—professional engineer, lead the session "What Would You Do?" Participants broke into small groups to discuss various case studies, offer input, and make decisions on how to react to each scenario related to roadway types and weather conditions.

WVDOH District 5 Highway Equipment Specialist Gary Eye taught participants how to improve snow fighting techniques and prepare for the upcoming snow fighting season during "An Ounce of Prevention: Dry-Run Checklists."

The session introduced the new WVDOH dry-run checklist and covered the state's spreader calibration policy.

We received great feedback from the workshop evaluations and hope to make the event even better next year, with more hand-on demonstrations, specific breakout sessions for mechanics, drivers, and managers.

We wish everyone a safe snow fighting seasoning. Happy plowing!

Shepherdstown Finds Solution for Sidewalk Repair

by Mark Franz and Weslie Boyd

Cracking and deteriorating sidewalks are an issue for many communities across the state. The community of Shepherdstown is no exception. Many of the sidewalks were old, unattractive, and needed repaired. The cracked and uneven surfaces made it difficult for pedestrians both on foot and in wheelchairs to navigate and posed tripping hazards.

The American Disabilities Act (ADA) defines a trip hazard as any vertical change of ¼" or move at a joint or crack. The town did not have the luxury of excess time or funds to fix the problem; they needed a cost-effective and time effective solution. Public Works Director Frank Welch researched various options for fixing the sidewalks, and in doing so, discovered GrindAll Concrete Grinding, a company based in Cleveland, Ohio.

Instead of replacing concrete slabs to remove trip hazards, GrindAll employees mill the concrete to repair it. Through this process, clients no longer need to replace the entire slab, which eliminates the need to use noisy jackhammers and other equipment. It also eliminates unsightly areas and messy removal. The process can be completed quickly and year-round. GrindAll helps fix problems including raised concrete, raised curbs, and pitted concrete. According to the company's Web site, "Concrete grinding is a repair technology that makes use of the existing concrete slab to eliminate replacing concrete that is in good condition." The company also complies with the ADA standards. For every inch the company grinds, they also grind a foot back to create a slope that helps people with disabilities maneuver more easily.

The Corporation of Shepherdstown has only used the company's services once and was pleased with the outcome. GrindAll charged $19.50 per linear foot to mill, with the entire procedure costing the Corporation of Shepherdstown $13,000. The work was completed in two-days. "We are very satisfied and strongly recommend the milling service," says Welch.

The top photo illustrates a 1 inch trip hazard in a sidewalk. The bottom photo shows the results after using GrindAll.

WV LTAP Offers Programs to Aid Accessibility

If your municipality needs help with aging sidewalks, the West Virginia LTAP offers several training sessions that can help. Director Ron Eck offers two training sessions that will benefit municipalities with sidewalk problems. The first is the Designing Pedestrian Facilities for Access. In this session, participants will learn about the Americans with Disabilities Act and how to design more accessibly. This course will be offered March 26, 2008 in Weston, W.Va. and May 13, 2008 in Elkins, W.Va.

The Walkable Communities Workshop is another training that will help municipalities with sidewalk issues. This four hour session is intended to increase awareness of pedestrian safety and walkability, generate local commitment to begin working as a community on specific pedestrian issues and problems, and help communities structure that commitment into a plan of action. This service is offered for free of charge to communities that demonstrate broad-based support for the session. Call the LTAP Center at (304) 293-3031, ext. 2612 to schedule an appointment.

If you have questions about sidewalk repair or would like to know more about our training sessions, contact Program Coordinator Anthony Ford, P.E. at (304) 293-3031, ext. 2629.

The West Virginia LTAP Center is a part of the nationwide Local Technical Assistance Program (LTAP), which is funded by the Federal Highway Administration. The program also receives funding from the West Virginia Department of Transportation.

Mission:

The mission of the West Virginia LTAP 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.

Overall Goal:

The Center's overall goal is to improve the transportation system by focusing on professional training, technical assistance, and information dissemination.

To achieve this goal, the WV LTAP does the following:

- Provides on-site training and demonstrations
- Publishes a quarterly newsletter
- Maintains a video, CD-Rom, and publications library
- Provides technical assistance via mail, telephone, fax, email, or site visits

CDL Training Videos Available

As part of their job, many local and state roadway workers are required to have a Commercial Drivers Licenses (CDL), either a Class A or Class B. From time to time, the West Virginia LTAP receives requests for CDL training material. We are happy to announce that we now have two new training DVDs available for loan in our DVD/CD-ROM lending library.

We also have a printed copy of the West Virginia Department of Transportation, Division of Motor Vehicles CDL Manual, which was updated October 2007, available for loan. This manual can also be downloaded as a PDF directly from the West Virginia Department of Transportation, Division of Motor Vehicles's Web site at this link: http://www.wvdot.com/6_motorists/dmv/downloads/CDL-Manual.pdf. Applications and study manuals are also available at Division of Motor Vehicles Exam Centers and the Division of Motor Vehicles Regional Offices.

We encourage you to visit the West Virginia Department of Transportation, Division of Motor Vehicle's Web site at http://www.wvdot.com/6_motorists/dmv/6g0_cdl.htm for more information on West Virginia CDLs.

WVU Engineers Without Borders Helps Communities

by Kim Carr

West Virginia University engineering students recently formed an Engineers Without Borders Chapter and are looking for projects. The student organization reaches out to both local and international communities, and they are searching for West Virginia communities that need engineering related projects that may better their way of life. For example, WVU-EWB participates in projects such as water filtration, cheap sustainable clean energy, employing low maintenance infrastructure (roads, buildings, etc), agriculture systems, etc.

Engineers Without Borders (EWB) is a national, non-profit humanitarian organization that focuses on helping developing communities improve their quality of life. This organization combines the efforts of engineers and engineering students, along with incorporating volunteers with educational backgrounds such as business, education, and journalism.

Internationally, the WVU-EWB Chapter is planning to send a group of engineering students to Mexico over spring break to help construct greenhouses that will stimulate the community's economy.

Locally, the WVU-EWB Chapter is currently developing a partnership with Habitat for Humanity in Monongalia County to help develop a proposed subdivision in Jerome Park. "We will be helping them fundraise and possibly help explore making the development greener than Habitat for Humanity's past houses," says President Victoria Wheaton.

Over fifty students from mechanical, civil, chemical, electrical, aerospace, computer engineering, and landscape architecture are currently involved in the WVU-EWB Chapter. Contact President Victoria Wheaton at vwheaton@mix.wvu.edu to learn more about this organization or to discuss potential projects in your community.

WV LTAP Announces Ten Work Zone Sign Package Winners

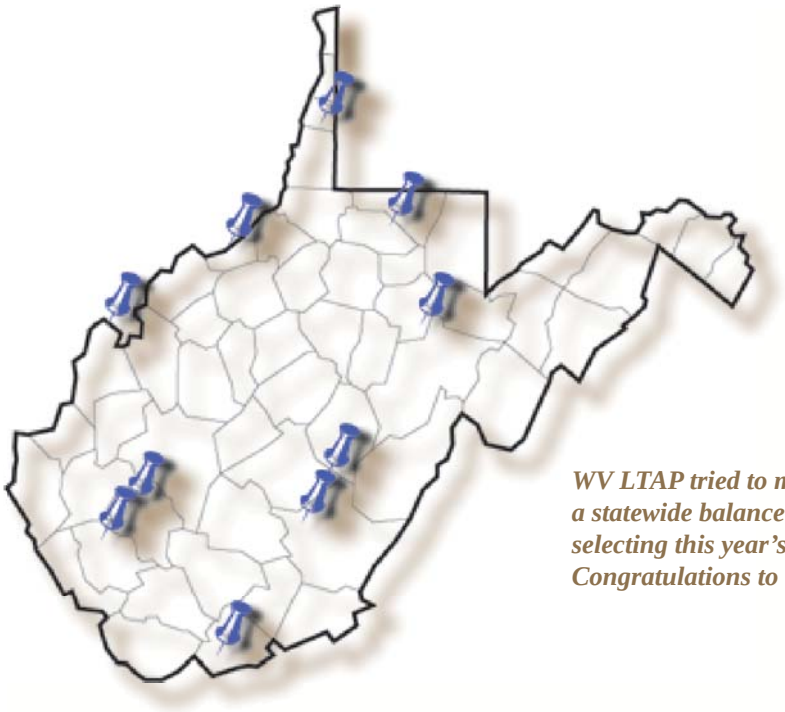
The Town of Grant Town, City of Madison, City of Logan, Town of Rupert, City of St. Marys, City of Bluefield, Town of Belington, Town of Triadelphia, City of Richwood, and Town of New Haven have been selected as 2007 Work Zone Sign Package recipients. The program began in 1995 and 43 packages have been distributed since its inception. Ten packages were awarded this year, the most to date.

Each selected municipality will receive eighteen portable work zone signs, six sign stands, four barricades, four plastic drums, sixteen cones, two reflective stop/slow paddles, and four Class 2 safety vests, which should enable the municipality to set up a safe and complete work zone.

In addition to the package, each municipality will receive a free, hands-on work zone safety training course that will be instructed by a WV LTAP trainer. The course will include specific instruction on how to correctly set-up work zones, which will provide a safer environment for both road crews and travelers.

The recipients were selected based on their demonstrated community need as determined from the quantitative data on the application form and by the narrative justification, statewide balance of distribution in terms of municipal characteristics (size of jurisdiction, location in state, special features, etc.), and the municipality's demonstrated involvement in West Virginia Local Technical Assistance Program activities (for example, attendance at training sessions, the annual Roadway Management Conference, and the Roads Scholar Program).

Fifty-one applications were reviewed, and the selection process was difficult. West Virginia LTAP intends to offer this program again in the coming years, and we hope your municipality will apply.



WV LTAP tried to maintain a statewide balance when selecting this year's recipients. Congratulations to the winners!

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Wishing you a Happy Holiday Season and a Wonderful New Year!

from West Virginia LTAP

Ron, Anthony, Kim, Mark, and Weslie

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WV LTAP is excited about the 2008 Roadway Management Conference March 31-April 2, 2008 in Wheeling, WV. We look forward to seeing you!

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