

Computer-Based Winter Roadway Maintenance Training Available

Kim Carr, WV LTAP



Hopefully the winter weather is behind us for another season, but preparing for the winter months is an ongoing endeavor and training is an essential component.

The WV LTAP is excited to announce the availability of the Winter Roadway Maintenance Computer-Based Training (CBT) resource. This resource consists of eight separate training sessions on CDs and DVDs, ranging in length from two to twenty-four hours, depending on the session topic. This Winter Roadway Maintenance CBT was developed by the American Association of State Highway and Transportation Officials (AASHTO), in cooperation with numerous state transportation agencies, the Clear Roads Consortium, the National Association of County Engineers (NACE), the American Public Works Association (APWA), and winter maintenance professionals across North America.

The Winter Roadway Maintenance CBTs are a great resource for self-paced training for individuals or a team of employees. The training can be done at your convenience and it doesn't have to be completed all at once. Best of all, it is available to you for free!

This training package includes narrated presentations with 2D and 3D animation, digital videos, photographs, and many more features that help keep users engaged and involved. Each session includes pre-test and post-test assessments. Users can also print certificates of completion when they finish a specific session.

Available Computer-Based Training

The winter maintenance training package consists of the following topics:

- Anti-icing/RWIS 24 Hrs.
- Selecting Snow and Ice Control Materials to Mitigate Environmental Impacts – 2 Hrs.
- Equipment Maintenance 2 Hrs.
- Proper Plowing Techniques 2 Hrs.
- Deicing 4 Hrs.
- Blowing Snow Mitigation 3 Hrs.
- Winter Maintenance Mitigation 2 Hrs.
- Winter Maintenance Management 2 Hrs
- Performance Measures for Snow and Ice Control Operations – 4 Hrs.

To obtain a complete set of this training, request specific material, or get additional information, please contact the WV LTAP technical assistant at 304-293-9922 or by email at wvltap@mail.wvu.edu.



WestVirginiaUniversity_

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Don't Miss Out on Training Opportunities *Country Roads & City Streets* is typically published quarterly. The purpose of this newsletter is to provide information that is beneficial to decision makers, elected officials, and roadway construction, maintenance and management personnel.

The material and opinions included in this newsletter are those of the West Virginia LTAP and do not necessarily reflect the views of the Federal Highway Administration or the West Virginia Department of Transportation. Every effort has been made to ensure the integrity and accuracy of both original and borrowed material; however, the West Virginia LTAP does not assume responsibility for any information that is found to be incorrect.



The West Virginia LTAP is part of the National Local Technical Assistance Program, which is funded by the Federal Highway Administration. West Virginia LTAP also receives funding from the West Virginia Department of Transportation.

MISSION:

The mission of the WV 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.

To help achieve this mission, training, demonstrations, personalized technical assistance, and resource materials are provided.

EVERY DAY COUNTS INITIATIVE

Information for this article obtained from the FHWA Every Day Counts Website and the WVDOT. (fhwa.dot.gov/everydaycounts/)



Every Day Counts (EDC) is a federal initiative designed to identify and deploy innovation aimed at shortening project delivery, enhancing roadway safety, and protecting the environment.

Every Day Counts is not about inventing the next "big thing." It is about taking effective, proven, and market-ready technologies and getting them into widespread use. By advancing 21st century solutions, we can improve roadway safety, reduce congestion, and keep America moving and competitive.

By focusing on shortening project delivery, projects can be delivered sooner, which means the public can enjoy their benefits sooner. To deliver projects more quickly, FHWA will help the highway community make routine use of innovative practices. The FHWA has assembled a toolkit that includes ideas for avoiding duplicating efforts in the planning and environmental review process. EDC also spotlights opportunities for states to utilize innovative contracting practices to improve quality and timeliness of project delivery.

FHWA Administrator Victor Mendez has stated, "Our society and our industry face an unprecedented list of challenges. Because of our economy, we need to work more efficiently. The public wants greater accountability in how we spend their money. We need to find ways to make our roads safer, and we have an obligation to help preserve our planet for future generations..."

This article focuses on five of the initiatives that the WVDOT has selected. For more details, please visit the EDC website (fhwa.dot.gov/erydaycounts), or contact the WVDOH or FHWA WV Division Statewide EDC Coordinators. (*Contact information on page 6*)

WARM-MIX ASPHALT (WMA)

Warm–Mix Asphalt (WMA) is the generic term for a variety of technologies that allow asphalt to be produced and then placed on the road at lower temperatures than the conventional hot–mix method. WMA production is possible at temperatures ranging from 30 to 120 degrees lower than hot mix. In most cases, the lower temperatures result in significant cost savings and reduced greenhouse gas emissions because less fuel is required. WMA also has the potential to extend the construction season, allowing faster project delivery. By 2009, more than 40 states constructed WMA projects, with 14 adopting specifications to accommodate WMA.

THE SAFETY EDGE

The Safety Edge is a simple but extremely effective solution that can help save lives by allowing drivers who stray off a highway to return to the road safely. Instead of a vertical drop–off, the Safety Edge shapes the edge of the pavement to 30 degrees. Research has shown this is the optimal angle to allow drivers to re–enter the roadway safely. The asphalt Safety Edge provides a strong, durable transition even for vehicles that are particularly vulnerable, such as smaller and lighter cars. Even at higher speeds, vehicles can return to the paved road smoothly and easily. FHWA's goal is to accelerate the use of the Safety Edge technology, working

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LATEST WORK ZONE SIGN PACKAGE RECIPIENTS



December 2010 marked the 15th year the WV LTAP awarded Work Zone Sign Packages. The four West Virginia municipalities that were awarded a 2010 Work Zone Sign Package were the Town of Bramwell, Town of Burnsville, Town of Chapmanville, and the Town of Mason. All of the recipients will use these packages to help improve work zone safety in their communities.

These four municipalities were awarded Work Zone Sign Packages due in large part to their demonstrated need for work zone traffic control equipment. The WV LTAP staff and the recipients realize that having proper equipment is only part of the solution; the other part is being knowledgeable about using the equipment properly and setting up work zones correctly. Thus, one of the requirements of being awarded a WV LTAP Work Zone Sign Package is agreeing to either host, or attend a free half-day workshop on work zone safety.

Since the program began in 1995, WV LTAP has awarded 63 Work Zone Sign Packages. Packages are valued at approximately \$3,000 each and include the following: two reflective "Stop/Slow" paddles, two whistles with lanyards, four Class III full-coverage safety vests, four plastic drums, four barricades, six sign stands, sixteen cones, and eighteen work zone signs.

This program is one of many led by the WV LTAP to ensure high quality training and equipment is provided for areas all over West Virginia. The goal of this program is to help municipalities improve the quality of their work zone traffic control and, ultimately, improve traffic safety in the state.

As in previous years, the WV LTAP received numerous applications, all demonstrating a great need. Municipalities that were not awarded a package are encouraged to reapply in the future and to remain committed to making their work zones safer for both employees and the public.

The WV LTAP is willing to come to your location to offer a free class on work zone safety, along with numerous other training topics. Please call 304-293-9924 if you would like to schedule a class or get more information.

Clockwise from top left:

1. Town of Mason employees Steve Myers and David Bird ventured out into the winter weather in Morgantown to pick up their town's Work Zone Sign Package.

2. Town of Burnsville employees Rick Ratliff and Harley Mace finished packing their town's Work Zone Sign Package and posed for a picture before returning to Burnsville.

3. Sally Stollings and Steven Savage take time for a picture before securing their Work Zone Sign Package for the drive back to Champmanville.

4. Rick Ratliff and Harley Mace, from the Town of Burnsville, load items from their awarded Work Zone Sign Package.







DON'T RUN SHORT ON CONCRETE: ESTIMATING PROJECT QUANTITIES

Article adapted from an original article authored by John Hopkins, Municipal Transportation Specialist, PSATS Reprinted with permission of the Pennsylvania LTAP

Have you ever seen a work crew pouring concrete and heard someone yell, "Oh crap! We're going to need more concrete!" Or, have you ever watched as concrete is poured level with the top of the forms and then the concrete truck driver says, "Well, that is the last of them. What do you want me to do with the three yards of concrete left in my truck?"

Using concrete doesn't have to be that way. Roadway agency employees can determine the appropriate amount of concrete needed for any type of project once they learn how to calculate amounts using some simple math formulas.

UNDERSTANDING THE MATH

To start, let's review some basic math.

Convert to common units — To begin, you must convert all measurements into common units (such as inches, feet, yards, etc). How would you multiply 11 feet times 6 inches, for example? You would convert either the 11 feet into inches or the 6 inches into a decimal part of a foot.

Inches into feet — Converting the 6 inches into a decimal part of a foot is the preferred choice since in our English system of measurement, the "foot" is the base unit. This system then divides feet into smaller units (inches, fractions) or multiple units of a foot (yards, miles).

So, how do you convert 6 inches into feet? There are 12 inches in 1 foot. If you take the number of measured inches (6) and divide it by the number of inches in a foot (12), you will have the measurement expressed in feet (in decimal form). In our example $6 \div 12 = 0.50$ feet.

Using this conversion formula in another example, you would change 7 inches into feet by taking the number of inches (7) and dividing it by 12 to get 0.583333 feet, which you can round to 0.58 feet.

Fractions into decimals — But, what do you do if your measurement is in fractions of an inch? Since you are changing the inches into decimal numbers, you will need to change the fractions into decimals.

To do this, simply take the top number in the fraction and divide it by the bottom number. For the fraction ½, for example, you would divide the top number (1) by the bottom number (2) to get 0.5. For the fraction 3/8, divide 3 by 8 to get 0.375, which you can round to 0.38. For 5 ¼, you would divide 1 by 4 to get 0.25. Then you would add it to 5; therefore it would be 5.25.

With all the numbers now in decimal form, you can proceed with converting inches into feet.

APPLYING THE CALCULATIONS

Use the formula — Once you have all the measurements converted into like units (feet) in decimal form, you are ready to apply some calculations to your measurements. Calculating quantities for concrete can be obtained by using three dimensions: length (L) times width (W) times the height (H) or L x W x H. If you are using feet as your standard unit of measurement, this formula will give you the volume of concrete in cubic feet.

Most projects use standard-dimension lumber for forms: 2-by-4s or 2-by-6s. A 2-by-4 is actually 3½ inches wide and a 2-by-6 is 5½ inches wide. That's important to know when you begin your calculations.

Sidewalk Project Example. You are pouring a sidewalk 4 feet wide by 125 feet long and using 2-by-4s for forms. To calculate the quantity of concrete needed for this project, you will use the formula L x W x H to get cubic feet.

Convert to common units. Before you can calculate this quantity, you have to convert the 3½ inches into feet. To do that, first change the fraction ½ into a decimal ($1 \div 2 = 0.5$) and add this to the 3 inches to get 3.5. Next, divide the 3.5 inches by 12 to change it into feet: $3.5 \div 12 = 0.291666$ feet, which you can round to 0.29 feet.





Plug measurements into the formula L x W x H. Now, you are ready to plug your measurements (all expressed in feet) into the L x W x H formula to get the necessary quantity of concrete expressed in cubic feet. Keep in mind that the height of the form is really $3\frac{1}{2}$ inches (0.29 feet), not 4. So your calculation will be 125 feet (L) x 4 feet (W) x 0.29 feet (H) = 145 cubic feet.

CONVERT CUBIC FEET INTO CUBIC YARDS

Ready mix concrete is measured in cubic yards. You will need to convert your cubic-foot measurement to cubic yards. (Remember 3 feet = 1 yard.)

Using the formula $L \times W \times H$, we know that there are 27 cubic feet in a cubic yard (3 feet x 3 feet x 3 feet = 27 cubic feet).

Our sidewalk project example requires 145 cubic feet of concrete. To convert to cubic yards, divide 145 by 27, which equals 5.37 cubic yards ($145 \div 27 = 5.37$).

Since concrete is usually ordered to the nearest ¼ to ½ cubic yard (0.25 to 0.50 cubic yard), you would round the 5.37 to 5.50 cubic yards. By ordering this amount of concrete for your sidewalk project, you are guaranteeing that you will neither run short nor have too much excess concrete. Learning how to calculate the quantity of concrete needed for a project will help save you time, money, materials, and aggravation.



A cubic yard equals 27 cubic feet.

Note: There are several online calculators that can also be used for figuring the quantities of materials such as concrete, asphalt, and aggregates.

REVIEW OF **C**ALCULATING THE VOLUME FOR **O**RDERING **C**ONCRETE

1. Convert all measurements into common units (usually into feet). If there are any fractions, first convert them into decimals.

Example 3½ inches = 3.5 inches 3.5 inches = 0.29 feet **Calculation** 1 ÷ 2 = 0.5 in., 3 + 0.5 = 3.5 in (3.5 in. ÷ 12 in./foot = 0.29 feet)

2. Plug all measurements into the formula for volume – length x width x height $(L \times W \times H)$ – to get a measurement expressed in cubic feet.

Example: 125 feet (L) x 4 feet (W) x 0.29 feet (H) = 145 cubic feet (Volume)

3. Convert cubic feet to cubic yards by dividing the measurement determined by the formula for volume by 27 (the amount of cubic feet in a yard).

Example: 145 cu. ft. ÷ 27 cu. ft./yard = 5.37 cubic yards (round to 5.50)

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with states to develop specifications and adopt this pavement edge treatment as a standard practice on all new and resurfacing pavement projects.

ADAPTIVE SIGNAL CONTROL TECHNOLOGY

Poor traffic signal timing contributes to traffic congestion and delay. Conventional signal systems use pre-programmed, daily signal timing schedules. Adaptive signal control technology adjusts the timing of red, yellow, and green lights to accommodate changing traffic patterns and ease traffic congestion. The main benefits of adaptive signal control technology over conventional signal systems are that it can:

- continuously distribute green light time equitably for all traffic movements;
- improve travel time reliability by progressively moving vehicles through green lights;
- reduce congestion by creating smoother flow; and
- prolong the effectiveness of traffic signal timing.

Adaptive Control Software Lite (ACS– Lite) is an example of adaptive signal control technology. ACS–Lite was specifically designed to be deployed using conventional control equipment, communications, and traffic sensors on arterial streets, making it a cost– effective alternative to other signal timing adjustment technologies.

GEOSYNTHETIC REINFORCED Soil (GRS)

Instead of conventional bridge support technology, Geosynthetic Reinforced Soil (GRS) Integrated Bridge System (IBS) technology uses alternating layers of compacted granular fill material and fabric sheets of geotextile reinforcement to provide support for the bridge. GRS also provides a smooth transition from the bridge onto the roadway, and alleviates the "bump at the bridge" problem caused by uneven settlement between the bridge and approaching roadway. The technology offers unique advantages in the construction of small bridges, including:

- reduced construction time and cost, with costs reduced 25 to 60 percent from conventional construction methods;
- easy to build with common equipment and materials; easy to maintain because of fewer parts; and
- flexible design that is easily modified in the field for unforeseen site conditions, including unfavorable weather conditions.

DESIGN **B**UILD

Traditionally, a project is designed, put out for bid to construction firms, then built by the winning bidder (design-bid-build). Design-Build (DB) is an alternate method of project delivery in which the design and construction phases are combined into one contract, eliminating the separate bid phase and allowing certain aspects of design and construction to take place at the same time. This can provide significant time savings compared with the design-bid-build approach, where the design and construction phases must take place in sequence.

With DB project delivery, the designerbuilder assumes responsibility for the majority of the design work and all construction activities. This provides the designer-builder with increased flexibility to be innovative, along with greater responsibility and risk.

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WV LTAP Recognizes Retirees



Left to Right: Gary Lanham, Bob Amtower, Bill Rumble, Buddy Shreve, Mike DeMary

At the end of last year. the WV LTAP recognized the accomplishments, tireless efforts, and dedication of several Advisory Board members and an individual — while not a formal member of the board - who never hesitates to help the WV LTAP. All five of these individuals have contributed much to the WV LTAP, for which we are extremely grateful. A huge thank you goes out to each of you!

We are pleased that **Bob Amtower** has remained an active Board member. After retiring as the West Virginia Division of Highways (WVDOH) District 5 District Engineer, Bob began working as an engineer with RK&K. Bob has strengthened our Board with his perspective from his previous state agency role, and now with his perspective from his private sector role.

Prior to retiring, **Mike DeMary** worked for the City of Fairmont as the Public Works Director and later as the Stormwater Program Manager. Even though he is retired from his municipal position, Mike will remain a member of the board; we are looking forward to helping keep him busy! Mike enjoys fishing, hunting, gardening, cooking, traveling, and spending time with his family.

Gary Lanham retired from the WVDOH after forty years in various engineering positions and most recently as the Director of Training. Gary also served as a navigator in the WV Air National Guard for thirty years. He is loving retirement and is enjoying traveling with his wife Kathy. Gary is also a certified facilitator for the 7 Habits of Highly Effective People Signature Program and even though he has retired from the WVDOH and the Board, he plans to continue assisting the WV LTAP with The 7 Habits of Highly Effective People workshops.

Bill Rumble is the individual we affectionately refer to as our WV LTAP Roadie. Aside from retiring as the City of Morgantown's Assistant Public Works Director, Bill is an avid musician and is very knowledgeable about sound equipment and presentation electronics in general. We have relied on Bill over the years and appreciate him always being willing to lend a hand, whether it's helping us with sound equipment at our outdoor demonstrations or speaking at an event.

Buddy Shreve retired from the City of Philippi as the Public Works Director in November 2010, after working for the city for twenty-five years. Prior to coming to the Public Works Department, Buddy worked in the surface mining industry for fifteen years and served two years in the Army. He was a tremendous asset to the Board. Buddy is enjoying his retirement and is excited to have more time to devote to his hobbies of cattle farming, woodworking, reading, and traveling.

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DON'T MISS OUT ON TRAINING OPPORTUNITIES



The WV LTAP regularly uses electronic notices to advertise upcoming workshops, conferences, and other programs. We post items on the WV LTAP website (http://wvltap.wvu.edu) and we send emails announcing classes for which we are accepting registrations.

If you would like to get notices of upcoming training opportunities and are not sure if we have your correct contact information, please send an email to Kim.Carr@mail.wvu.edu. Please use the subject line *Updated Address*. Also, include your name, mailing address, email address, and phone number. This will help ensure you get notices in a timely manner and have the opportunity to attend WV LTAP sponsored workshops and classes.

We rely on our clients to help us keep the WV LTAP client database current. If

you are receiving multiple copies of this newsletter or training notices, if there are people that are no longer in your agency, or if you would like to be removed from our contact list, please let us know.

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