

ON THE MOVE WITH THE PRT

Andrew Morgan and Kim Carr, WV LTAP

If you have ever been to Morgantown, WV or seen the views of town shown during televised football and basketball games, you are probably aware of West Virginia University's Personal Rapid Transit system, known simply as the PRT. It is those blue and gold small vehicles driving on a track. The PRT is seen by some as an oddity, by others as a means to get around town, and by many WVU students as their primary transportation between WVU's campuses.

It is currently the only operating PRT in the United States, and it is a vital form of transportation for this university town. Though other transit systems may claim they are PRTs, when the system is operating in demand or schedule mode, Morgantown's is the only one where riders can get on cars and travel directly from point-to-point.





The PRT provides riders with scenic views, especially during the fall.





IN THIS ISSUE

Pages 1, 2, and 3 On the Move with the PRT

Page 3 LTAP's Region 3 PRT Tour

Page 4 WV LTAP Advisory Board Retirements

Roads Scholar II Graduates

Page 5 A Word to the Wise

Page 6 Road Facts: Sharing the Road with Deer

Page 7 Street Smarts Contest WV LTAP Facebook Page Roadway and Other Fun Facts

Pages 8 & 9 WV LTAP's 2014 Build a Better Mousetrap Competition & Entry Form

Page 10 PA LTAP's 2013 Build a Better Mousetrap Winners

Page 11 Road Facts: Railroad Crossings

Page 12 Free NHI Maintenance Training Series: Weather-Related Operations

Page 13 A Flurry of Topics Were Covered at the 2013 Snow and Ice Control Workshop

Pages 14 & 15 7 Recommendations for Salt Application

Page 15 WV LTAP Training *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.

HISTORY

WVU opened in 1867 as a small agricultural university in Morgantown, population 797 (1880 census). At the end of World War II, WVU had grown to 8,000 students with the city building up around campus. Enrollment continued to increase at WVU, and there was no remaining room to grow downtown, so in the late 1950s WVU purchased land two miles away to create the Evansdale Campus. In the 1960s, WVU's enrollment was nearing 14,000 students and many needed a way to travel between the two campuses. In addition to the rapid growth of WVU, the City of Morgantown was also growing. The 1960 census showed a Morgantown population of 22,487 and the university's two-campus structure was causing a traffic nightmare for students and residents. While WVU did provide bus service between campuses, the buses were stuck in traffic along with everyone else. The city's transportation network needed to improve in order for WVU and Morgantown to grow and thrive; conventional approaches, such as widening streets, were not considered feasible.

Dr. Sammy Elias, professor of industrial engineering at WVU, was inspired by a never before used transit concept being promoted by the US Department of Housing and Urban Development (HUD), which had released a series of studies in 1968 discussing the potential of personal rapid transit. Many companies quickly went into development on PRT systems and there was a strong push to build a real-world demonstration site in the U.S. Dr. Elias believed Morgantown would be an ideal location for the demonstration. He began petitioning for Morgantown, and with the help of West Virginia Senator Robert C. Byrd, Morgantown was selected.

Boeing was contracted in 1970 to begin the process of making Morgantown's PRT a reality. The initial budget for the project was \$15-20 million; however, the designers and manufacturers were developing a never before used concept under a tight deadline. When Phase I (5.2 miles of track, 45 cars, and 3 stations) of the system was complete in 1975, the project had already cost over \$60 million. During Phase II (1978-79), the system was increased to 8.65 miles of track, 71 vehicles, and 5 stations for a total cost of \$130 million. Since its completion in 1979, the PRT has remained largely unchanged.

THE PRT SYSTEM

VEHICLES

The PRT system currently operates 73 vehicles, with each vehicle weighing over 8,500 lbs. The vehicles are built on a Dodge truck chassis, powered by an electric motor. Electric pickups (guide wheels) are fixed on both sides of each car, which connect to electrified rails on one, or both, sides of the guideway. The vehicles' wheels steer slightly toward whichever side is powered.

Each PRT vehicle is able to accommodate eight riders seated and up to twelve riders standing. The vehicles have an average speed of 14 mph, with a top speed of 30 mph. Every PRT vehicle is handicapped-accessible. When the vehicle stops at the unloading platform, the door automatically opens so passengers can disembark at their desired station. Approximately 15,000 people ride the PRT each day when WVU is in session. WVU students swipe their student ID cards to ride and the general public pays 50 cents per ride.

STATIONS

Five different stations serve as access points for getting on and off of the PRT and are placed at various locations around Morgantown. The five stations are Walnut, Beechurst, Engineering Sciences, Towers, and the Health Sciences Center. According to the WVU PRT webpage, it takes 11.5 minutes to ride the entire length of the system, which contains over 8.5 miles of track, from the Walnut Street Station downtown to the Health Sciences Station, near WVU's medical complex.

GUIDEWAY AND OPERATIONS

It is essential for the guideway surface to be heated, for the PRT to be able to operate during the winter weather. A heated water-propylene-glycol solution circulates through pipes that are embedded in the tracks.

The Morgantown PRT has three modes of operation: **demand**, **schedule**, **and circulation**.

In **demand mode**, the rider pushes a buttom to call a PRT vehicle for their desired station. A timer begins after the button is pushed, and typically after five minutes, a PRT vehicle is activated to service the request, even if there is only one rider requesting a destination. Additionally, a PRT vehicle is immediately activated if a predetermined number of passengers, typically 15, have selected the same destination. The system operates as a true PRT during the demand mode.

During peak usage hours, the PRT operates in **schedule mode.** The PRT vehicles run on a fixed route schedule, that has been established based on known demand. During peak hours, the schedule mode decreases the waiting time for a vehicle traveling to a given destination. The schedule mode is also more efficient than demand mode during these times.

Circulation mode is used during lowdemand, low peak times. During circulation mode, the PRT vehicles stop at every station, using a limited number of vehicles.

The entire PRT system is monitored from a central control room. PRT employees are able to see the status of every car at all times, and are able to quickly respond to any vehicle failures or shutdowns. Cameras are also at every PRT station.

West Virginia University and the Morgantown area have seen, and are continuing to see, tremendous growth. Traffic continues to be an issue, but without the PRT, Morgantown would be gridlocked, students would be missing classes, and parking would be even more challenging.

OTHER PRT FACTS

- The PRT is a public transportation service that receives capital funding assistance from the Federal Transit Administration.
- Around 60 million people have traveled the PRT since 1975.
- Since opening in 1975, the PRT has traveled approximately 22 million miles along its tracks.
- The vehicles position on the tracks is monitored constantly through computers.
- The New Electric Railway Journal rated the PRT as the best overall performer in its category.

Source: transportation.wvu.edu/ prt/facts_about_the_prt

Article Sources: US Census Bureau, Census.gov; TRB 2004 Paper, *Morgantown People Mover-Updated Description*, http://www.cities21.org/ morgantown_TRB_111504.pdf; *A Ride of the Future* Youtube video, http://www.youtube.com/watch?v=fEgboXXflwo; Progressive Engineer, *Still in a Class of its Own*, http://www.progressiveengineer.com/PEWebBackissues2002/PEWeb%2024%20Mar%2002-2/PRT.htm

LTAP'S REGION 3 PRT TOUR

This past October, the WV LTAP hosted a regional meeting in Morgantown that included employees from Delaware, Maryland, Pennsylvania, and Virginia, who work in other Region 3 LTAP Centers. As part of this event, the meeting participants were able to ride the PRT from end-to-end, learn more about the system from PRT staff, see the control room in action, and learn

about everything else that makes this system successful. This tour also gave those of us that live in Morgantown a fresh perspective and appreciation of this system. We were able to see how amazing this system is, and while it's something we often take for granted, this tour helped us remember how truly fortunate WVU and the City of Morgantown are to have this transit resource.

John Massullo, PRT Maintenance Manager, explained the operation of the PRT control room. He also discussed specific features of the PRT vehicles and rails, such as the hydraulics and guide wheels.



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WV LTAP Advisory Board Retirements



Kathy Holtsclaw

Kathy Holtsclaw retired from the West Virginia Division of Highways in October. Kathy also served as the Project Monitor for the WV LTAP. We learned so much from Kathy over the years and we will definitely miss her.

This fall, **Gary Winter** retired from the West Virginia Governor's Highway Safety Program. Gary was a great advocate for the WV LTAP and we will miss Gary's insight and support.



Gary Winter

To both Kathy and Gary, thank you for all of your service, to both the State of WV and the WV LTAP. We wish you a happy, healthy, and fulfilling retirement!

2013 ROADS SCHOLAR II GRADUATES



WVDOH - D5

RS II Graduates from WVDOH-D5 are shown here with Liz Harper, Training Coordinator

Gary Hines, Greg Ayers, Harold Riggleman, Gary Stickley, and Patrick Thompson



WVDOH - D6

Congratulations to Josh and Floyd Norris, WVDOH-D6 employees and brothers!

A WORD TO THE WISE

Reprinted with permission of the Baystate Roads Program and Dr. Rockie Blunt

As the final exercise during a series of "Succeeding as a Foreman" workshops that were hosted by the Baystate Roads Program (Massachusetts LTAP), the instructor asked the participants the following question: "What advice would you give to someone who was just promoted to foreman (or working foreman, truck foreman or supervisor) to help them become successful as a leader?"

The following are the top ten pieces of advice, along with a brief summary by the workshop instructor, that can help anyone who is in a supervisory or leadership position.

1. Make them want to come to work. Create a cooperative, supportive atmosphere on the job that puts people at ease and looking forward to the work day.

2. Have a positive attitude. You will get a lot more out of your crew if you don't intimidate them or make them feel fearful or resentful. People are more productive if they are in a good mood.

3. Give and get respect. Respect is a twoway street. In order to be treated the way you want to be, treat others as they want to be treated.



BigStockPhoto.com Image

4. Listen and talk. Keep the lines of communication open in both directions. Let them know what your expectations are, make sure they know how to perform their tasks, and listen to their questions, ideas and suggestions.

5. Treat them as you want to be treated. Remember, the Golden Rule—"Do unto others as you would have them done unto you"—also applies to the workplace.

6. Don't ask them to do anything you wouldn't do. One important way to motivate individuals is to work alongside them. Don't act as though you're "above" them.

7. Throw them a bone every once in a while. Quite simply, don't forget to show your appreciation for a job well done. Even a simple "thank you" goes a long way.

8. Have strong principles. What does your department stand for? What are your values? Honesty, trustworthiness and integrity were mentioned in the workshops.

9. Be a teacher. Helping people learn is a more important part of your job than you may realize. Take as much time as necessary to train your crew.

And perhaps the most important piece of advice to new foremen:

10. Be a good leader. Establish specific goals for your department, communicate them clearly, and motivate everyone to work toward them.

Dr. Rockie Blunt, president of West Boylston-based Blunt Consulting Group, has worked with municipal and state agencies for many years. Special thanks to Dr. Blunt and the Baystate Local Roads Program for granting permission to reprint this information.

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ROAD FACTS INFORMATION SHEET

Road Facts has been designed to help provide useful tips and facts regarding roadway issues. The Road Facts series can be downloaded from the WV LTAP website (wvltap.wvu.edu) as a PDF or Microsoft Publisher file. The Publisher files are formatted so agencies can add their individual contact information if desired. The WV LTAP does ask that the main text not be changed or altered without permission. Agencies are encouraged to post these information sheets on their webpage, distribute printed copies to elected officials and citizens, send out in mailings, etc. The WV LTAP staff welcomes your suggestions for new topics and will continue adding new sheets as they become available.

SHARING THE ROAD WITH DEER



According to State Farm, for the sixth year in a row, West Virginia is the most likely state for a driver to hit a deer, with drivers in West Virginia having a 1 and 40 chance of hitting a deer over the next 12 months. November, which is hunting and mating season, is the most likely month that a motorist will hit a deer, with October and December being the second and third most likely months. State Farm Insurance reports that the average damage cost of deerrelated collisions during the last half of 2011 and the first half of 2012 was \$3,305.

The Insurance Information Institute (I.I.I.) has published the following information that can help reduce your chances of being involved in a deer-related collision. The WV LTAP staff has compiled this information directly from the I.I.I.

in the list below; we urge you to read through this information to help save vehicles, occupants, and deer.

- Deer are not just found on rural roads near wooded areas; many deer crashes occur on busy highways near cities.
- Deer are unpredictable, especially when faced with glaring headlights, blowing horns and fast-moving vehicles. They often dart into traffic.
- Deer often move in groups. If you see one, there are likely to be more in the vicinity.
- Drive with caution when moving through deer-related crossing zones, in areas known to have a large deer population and in areas where roads divide agricultural fields from forestland.
- Always wear your seatbelt. The Insurance Institute for Highway Safety reports that in a study of fatal animal crashes, 60 percent of people killed were not wearing a seatbelt. Sixty-five percent of people killed in animal related crashes while riding motorcycles were not wearing a helmet.
- When driving at night, use high beam headlights when there is no oncoming traffic. The high beams will better illuminate the eyes of any deer on or near the roadway.
- Be especially attentive from sunset to midnight and during the hours shortly before or after sunrise. These are the highest risk times for deer-vehicle collisions.
- Brake firmly when you notice a deer in or near your path, but stay in your lane. Many serious crashes occur when drivers swerve to avoid a deer and hit another vehicle or lose control of their cars.
- Do not rely on devices such as deer whistles, deer fences, and reflectors to deter deer. These devices have not proven effective.

In the event you hit a deer with your vehicle, the I.I.I. suggests:

- ... try to avoid going near or touching the animal. A frightened and wounded deer can hurt you or further injure itself.
- If the deer is blocking the roadway and poses a danger to other motorists, you should call the police immediately.

6

FALL/WINTER 2013 STREET SMARTS CONTEST





In what West Virginia city or town is this bridge located?

On, or after, January 2, 2014 the first correct answer posted on the WV LTAP Facebook page will be the winner of a fabulous prize! (Well, as fabulous as a prize can be under \$25.) The correct answer will only be accepted on our Facebook page. www.Facebook.com/WVLTAP

The winner will be announced on our Facebook page and in the next edition of this newsletter. So in addition to the fabulous LTAP prize, you'll also get bragging rights!

Jason Workman was the winner of the previous contest, held this past spring. The correct answer was 2nd Street in St. Mary's. Congratulations to Jason!

CHECK OUT THE WV LTAP FACEBOOK PAGE



The WV LTAP wants to remind you that we are on Facebook! We encourage you to visit our page and give us your feedback. You can find us by typing in www.Facebook.com/WVLTAP or within the search feature in Facebook, by typing WV Local Technical Assistance Program (WVLTAP). The page is set up so everyone can post comments; you don't need to become a "friend" or be accepted to post items. Just make sure to "like" us so anytime we add announcements, they will show up in your newsfeed.

This is a great place to check for upcoming training events, available give-a-ways, current transportation related items, photos, and much more. We also hope that in addition to checking out our announcements, this will be an interactive tool for you, our clients, to pose questions, share solutions, successes, challenges, etc.

ROADWAY AND OTHER FUN FACTS



Microsoft.com Image

DID YOU KNOW....

- The only state without any Interstate routes is Alaska. (www.milesurfer.com/ highway_trivia/highway_trivia_1.htm)
- There are three Interstates in Hawaii, H-1, H-2, and H-3. (www.milesurfer.com/ highway_trivia/highway_trivia_1.htm)
- One of the first suspension bridges in the world was completed in Wheeling, [WV] in November 1849. (www.50states.com/facts/westva.htm#.Uovm0sReZ_I)
- West Virginia is the only state in the Union to have acquired its sovereignty by proclamation of the President of the United States. (www.50states.com/facts/westva. htm#.Uovm0sReZ_)
- West Virginia is considered the southern most northern state and the northern most southern state. (www.50states.com/facts/westva.htm#.Uovm0sReZ_)

WV LTAP'S 2014 BUILD A BETTER MOUSETRAP COMPETITION

Recognizing Innovative Inventions and Improvements

HAVE YOU BUILT A BETTER MOUSETRAP?

Have you or one of your coworkers recently built an innovative gadget? Or have you developed an improved way to accomplish everyday tasks? If either of these apply, you've built a better mousetrap, and now is the time to show off a project your roadway agency is proud of in the WV LTAP's inaugural Build a Better Mousetrap Competition.

WV LTAP is looking for projects that you, your employees, or your crew designed and built or modified. It can be anything from the development of tools, equipment modifications, and/or processes that increase safety, reduce cost, improve efficiency, and improve the quality of transportation.



If you have something you think would qualify for this

competition, submit your entries by Wednesday, April 2, 2014. Entries will be judged by WV LTAP Advisory Board Members using the criteria of cost savings, benefits to the community and/or agency, ingenuity, transferability to others, and effectiveness. Winners will be recognized in this newsletter and receive a prize. The purpose of these competitions is to collect and disseminate real world examples of best practices, tips from the field, and assist in the transfer of technology.

WV LTAP staff members are also available to help with your write-up or to take photos. We know that you and your crews are doing phenomenal things, on limited budgets, but with unlimited imagination and foresight. Help us share your challenges and solutions with other agencies!

The winning entry will be submitted into the National LTAP Build a Better Mousetrap Competition. Winners of the national competition will be announced at the annual LTAP/TTAP national conference this summer. All entries at the national level will be posted on the LTAP/TTAP program website and compiled into an electronic booklet, with the winners receiving a recognition prize and bragging rights!

To enter the competition, complete the entry form on the following page and mail it to the WV LTAP or visit the WV LTAP website at wvltap.wvu.edu to download the entry form. Competition deadline is Wednesday, April 2, 2014.

If you have questions or need an application, please email Kim Carr at kim.carr@mail.wvu.edu or call 304-293-9924.

JUDGING CRITERIA

The competition is judged on the criteria listed below within the framework of a five-point rating scale. The winner is the entry that has the highest number of overall points.

Judging Criteria	Five-Point Rating Scale
Cost Savings	5 = Excellent
Benefits to the Community	4 = Very Good
Ingenuity	3 = Good
Transferability to Others	2 = Fair
Effectiveness	1 = Poor

2014 WV LTAP BUILD A BETTER MOUSETRAP COMPETITION ENTRY FORM

Photographs are encouraged but are not mandatory. You may use more than one page per entry. This form can also be downloaded from the main page of wvltap.wvu.edu.

Entry Title:		
Problem Statement:		
Discussion of Solution:		
Labor, Equipment, Materials Used:		
Cost:		
Savings/Benefits to the Community:		
Agency Name		
Contact Person		
Contact Phone	Contact Email	
Contact Mailing Address		
Please return your completed form by Wednesday, April 2, 20	114 to Kim Carr	
WV LTAP • PO Box 6103 • Morgantown. WV 26506		
Email: kim.carr@mail.wvu.edu or Fax: 304-293-7109		

Questions? Please call Kim at 304-293-9924.

PA LTAP'S 2013 BUILD A BETTER MOUSETRAP WINNERS

The following entries were the top three winners in the PA LTAP's 2013 Build a Better Mousetrap competition. All of these winners were looking for practical, low-cost solutions. The WV LTAP staff has no doubt that our WV roadway agencies face similar challenges and also continually find ways to stretch their dollars through creative and resourceful ideas. We look forward to hearing from our WV agencies!



BRINE MAKING TOTES

Nazareth Borough/Northampton County 1st place winner in the PA LTAP's 2013 competition and 3rd place winner in the 2013 National LTAP competition

Nazareth Borough wanted to apply brine to their streets. The Nazareth Public Works Superintendent, Robert Reimer, contacted Allen Township, who had been doing this for a couple of years. Allen Township had purchased the spray set-up along with a brine maker. Robert, along with his highway crew, had to come up with a way to make the brine and apply it at minimal cost to the Borough. They came up with an idea to use a palletized tote to make, apply, and store the brine. The highway crew took about a day to cut the tote, drill the holes and install the pipe and valves along with the wooden hopper. In total, the cost was approximately \$540. Savings are abundant as a manufactured system

can cost up to \$20,000. Savings for salt increase with each weather event; the first salting would take about 12-16 tons of salt for [the Borough's] streets. With brine, it takes about one ton of salt.

ANTI-SKID REMOVER FOR UNDER GUIDERAIL

Elk Township/Clarion County 2nd place winner in the PA LTAP's 2013 competition

Elk Township/Clarion County's entry was an Anti-Skid Remover for Under Guiderail that they fabricated. During winter maintenance months, anti-skid material collects under guiderails and storm water runoff does not remove it from the roadway. In order to alleviate this problem, the crew fabricated an apparatus which mounts to the mouldboard of a grader to push and remove material from under guiderail. The total cost of materials was approximately \$50, plus six hours of labor. This mechanism allows the Township to complete cleanup at 1/5 of the cost to complete it manually.





OFFSET SNOW PLOW

Borough of Mount Joy/Lancaster County 3rd place winner in the PA LTAP's 2013 competition

The Borough of Mount Joy/Lancaster County has an Amtrak Bridge with a 4 ft sidewalk that needs to be shoveled when it snows. Due to the length (+/- 400 ft), it often takes at least 3 men to shovel. There is no way to use a snow blower or any other machinery without closing the bridge due to [its] width. Through team brainstorming and ingenuity, the roadmaster designed a plow that could pivot off the 3-point hitch of a tractor, keeping the snow to the right side. This tool cost less than \$450 to complete and saves countless labor hours.

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RAILROAD CROSSINGS



WV LTAP Images

Have you ever been at a railroad crossing with the warning lights flashing and a train approaching and thought, "I can make it before the train gets here"? In some situations, you probably can, but is it worth the risk?

Crossing a railroad track with a train approaching in an attempt to save five or ten minutes on your trip could lead to serious injury or even death. In 2012 alone, the Federal Railroad Administration's (FRA) Office of Safety Analysis reported 1,962 highway-rail accidents. As a result of these accidents, 941 people were injured and 272 were killed.

Following the ten safety tips listed below can help prevent vehicle/train-related accidents.

- Always slow down when approaching a railroad crossing and look both ways, twice.
- Do not try to beat a train across the tracks, or go around the gates, ever.
- Never pass another vehicle when approaching a railroad crossing.
- Turn off the radio and roll down vehicle windows to listen for warning bells and train whistles at crossings.
- Always yield to railroad crossing warning devices and signs.
- Never shift gears on a railroad crossing.
- Do not attempt to cross a railroad track if your vehicle sits low to the ground and will drag on the tracks.
- When stopped at a railroad crossing, leave plenty of room between your car and the tracks (15 to 50 feet).
- Always cross at designated roadway crossings.
- Always remember a train is closer and traveling faster than you think!

Also, keep in mind that not all railroad crossings have warning devices, such as lights, bells, whistles, and gates; the railroad crossing may still be active with trains running on the tracks.

FREE NHI MAINTENANCE TRAINING SERIES: WEATHER-RELATED OPERATIONS

The National Highway institute (NHI) has several web-based trainings available, many for free. One of these free on-line training sessions is the one-hour Weather-Related Operations class. With winter weather already here, this no-cost web-based training module focusing on storm event management is a great training resource. To access this training, or others from NHI, visit https://www.nhi.fhwa.dot.gov.

COURSE NUMBER:

FHWA-NHI-134109H

COURSE DESCRIPTION:

Storm control is a major component of roadway maintenance in many areas of the country. State, municipal, and county



WVDOH Image

agencies are responsible for providing safe, passable roadways even in severe weather. While the majority of the Weather-Related Operations course concentrates on snow and ice storms, many of the elements apply to other weather events as well. Tornadoes, hurricanes, and flooding all require coordination and dedication of maintenance personnel. In any weather event, agencies need to restore roadways and bridges and to ensure they are safe for motorists.

Participants learn about the planning requirements for an effective storm response, including scheduling and training personnel, identifying equipment needs, executing dry runs, and the additional requirements posed by a multi-day storm event. This training assists participants with planning and responding effectively to all weather-related operations.

This training was developed as part of the Maintenance Training Series (134109), which features 11 no-cost web-based training modules related to roadway maintenance, such as Pavement Preservation Program, Shaping and Shoulders, and Roadway Drainage. To view all of the courses in the 134109 Maintenance Training Series, visit the NHI website.

OUTCOMES:

Upon completion of the course, participants will be able to:

- Identify the elements of an effective storm response plan
- Identify factors involved in scheduling personnel needs
- Identify safety and training considerations for maintenance personnel who are involved in weather-related operations
- Identify the types of equipment used in a snow and ice removal plan and their uses
- Describe how to identify equipment needs for a particular storm

TARGET AUDIENCE

This course is designed for state, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

If you have questions about this NHI training, please contact NHI at nhicustomerservice@dot.gov or 877.558.6873.

12

A FLURRY OF TOPICS WERE COVERED AT THE 2013 SNOW AND ICE CONTROL WORKSHOP

Kim Carr, WV LTAP

The WV LTAP hosted the 22nd Snow and Ice Control Workshop on September 24, 2013 at the Bridgeport Conference Center in Bridgeport, WV. This year's event included a host of new presenters, exhibitors, and both new and veteran attendees.

Jim Green, Alamo Group, talked to the group about the importance of pre-winter planning, effective winter maintenance operations for different types of snow, and safety practices and snow removal techniques for operators. Faith Borden, National Weather Service (NWS), provided an overview of weather patterns that produce significant winter weather events; a review of winter precipitation types; the definitions of winter storm warnings, advisories, and watches and how they differ by local NWS offices. Faith also provided an outlook for the 2013 winter weather season, along with discussing different NWS resources and notification systems that can help roadway agencies with monitoring the winter weather before, during, and after the storm.

Another important topic that was discussed at this event was power line safety. During storm cleanup work, roadway workers may encounter live wires and downed lines. Thomas Wilhelm, First Energy Corporation, spoke to the group about the hazards associated with downed lines and methods and techniques to use to help keep workers safer.

This year's workshop also included a panel discussion on the Hurricane Sandy Superstorm that hit parts of West Virginia last October. Panelists Jason Hunt, Jim Moore, and Donny Williams, all WVDOH employees, discussed many of the challenges faced, as well as some of the important lessons that were learned.

The benefits of using salt brine as an anti-icer, de-icer, or both were presented by Ron Eck, WV LTAP. Attendees learned about different options for obtaining salt brine, including manufacturing it in-house.

The WV LTAP expresses a sincere thank you to all of the vendors that exhibited and showcased products and to our partners that helped with logistics, presentations, and bringing equipment. Specifically, the WV LTAP says a huge thank you to

Sarah Marsh from WVDOH-D7 for providing a fully outfitted truck and going over backing safety and truck safety issues, The City of Morgantown for providing a single axle truck for safety backing demonstration purposes, The WVU Facilities Department for bringing their pick-up truck with the dump bed, and

Jeff Pifer from WVDOH-D4 for scheduling their brine tanker to be on-site.

This event is successful because of the willingness to help and share by all involved!



As in past years, outdoor demonstrations were part of this event. The photo on the left shows an outfitted double axle truck that was used to demonstrate pre-trip and post-trip equipment inspections, equipment blind spots, and other plow and truck safety features. The photo on the right shows a dump bed trailer that could be useful year-round for roadway agencies of any size.

7 Recommendations for Salt Application

Information is taken in part from the Salt Institute's Safe and Sustainable Snowfighting Handbook. Safewinterroads.org. Reprinted with permission.



There are no easy answers or solutions with snow and ice control because there are too many variables. It has been estimated there are over [66,500] different storm conditions – pavement temperature, ambient temperature, pavement type, solar radiation, traffic volume, traffic speed, wind direction and velocity, type of precipitation, topography, lake or ocean effect, shaded areas (by mountains, trees or buildings) and wind chill factor, to name a few.

Snow and ice control is a very complex issue and those people on the front line need the best information possible.

Salt is usually applied at the rate of 300 to 800 lbs per two-lane mile. As temperatures drop, either the quantity of salt or the frequency of application must be increased.

Anti-icing, that is spraying brine on pavement before the storm arrives, requires anywhere from 1/3 to 1/4 the material of deicing, making it the most cost-effective option for improving winter traffic safety.

Ideally, with any deicer, at the end of the storm all material should be completely used. Since storm forecasting is not precise, some residue may remain on the surface after some storms. The residue, if not blown off or washed away, will be effective in helping prevent bonding of ice and snow in the next storm. A deicer only has a residual effect if too much was applied for the storm condition.

Prewetting salt with brine speeds the reaction time of salt and also keeps salt from bouncing off the road so more of it is available to do the work. There may also be a combination of applications of any of the above. Most agencies agree that early anti-icing spraying is most effective and that prewetting of salt provides a faster, higher level of service at all temperatures.

Spreading can be done full-width or windrow. Both have strengths depending on conditions. Pay special attention to spinner speeds. A spinner that revolves too fast will throw salt over a wide area, possibly wasting material. You may correct overthrow by adjusting the drop location on the spinner by using your directional baffles or reducing spinner speed. Traffic density and highway design largely determine the spreading pattern required.

A windrow of salt applied in a 4-8 ft strip along the centerline is effective on two-lane pavements with a low to medium traffic count. Less salt is wasted with this pattern and quickly gives vehicles clear pavement under at least two wheels. Traffic will soon move some salt off the centerline and the salt brine will move toward both shoulders for added melting across the entire road width.

The full-width spreading pattern is used most often on multiple-lane pavements with medium to high traffic volumes. Melting action is obtained over the full pavement width. Vehicles tend to stay in line to clear wheel paths in the lanes.

Often the full-width pattern is used when trying to get salt down under a storm. But be careful not to waste salt when using this pattern.

Play the wind in spreading. A strong wind blowing across a street or highway can cause salt to drift as it comes out of the spreader, pushing it onto the shoulder or into the gutter. This is particularly true in rural areas where there are few windbreaks. How the wind affects spreading depends on both wind velocity and pavement condition. Spreader operators should play the wind to put salt where it will do the most good.

Because of the much greater control inherent to the spray process, antiicing is best applied with full-width stream nozzle systems to maintain a small width of bare pavement to reduce slipperiness. A fan spray is not recommended and care must be exercised during windy conditions.

Give salt time to work. Time plowing operations to allow maximum melting by salt. When you plow salt off the pavement, you waste deicing material and increase the cost of snow removal.

Know when to plow and reapply salt. The need for another salt application can be determined by watching melting snow kicked out behind vehicle tires. If the slush is soft and fans out like water, the salt is still working. Once the slush begins to stiffen and is thrown directly to the rear of the vehicle tires, it is time to plow and spread more salt. Has the weather changed? Remember the salt application rates may have to be increased at night, on sunless days and when the temperature drops sharply. Without the sun, the effect of solar radiation and warmth is lost. At night, traffic usually diminishes, minimizing another heat source that helps melt ice and snow. It is important to remember that pavement temperatures are seldom the same as air temperatures – a critical thought when choosing the options for snow and ice control – it is the pavement that will be treated.

Don't overlook the salt's anti-skid value. For years, maintenance people have observed that salt, applied as an ice melter, also gives anti-skid protection. Tests conducted in cooperation with the National Safety Council show that salt, applied at normal deicing rates, gives as much anti-skid protection as abrasives. The anti-skid effect of salt is immediate as it starts melting snow or ice.

Safeguard the environment. The way salt is spread can make the difference between whether the public appreciates or condemns snowfighters' efforts. Misuse ignores concern for the environment. Proper calibration of spreading equipment and good storage can avoid most problems.

WV LTAP TRAINING

In addition to providing training on a set schedule, the WV LTAP also provides a majority of our training on a per request basis. We know budgets are tight and that it is often difficult to find travel money, but we also know that training is still important to you. The WV LTAP has instructors that are available to come to your location. We do ask for a minimum of ten attendees, but you can invite others from neighboring municipalities, WVDOH districts, or other agencies to meet the minimum requirement. The WV LTAP staff is also available to help you recruit class attendees.

The following are a few of the classes we have scheduled for the months of

January, February, and March. More information, including a description of the class and registration information, can be found on our website at wvltap.wvu.edu. The following classes are available free of charge, unless a fee is indicated. Please contact Kim at kim.carr@mail.wvu.edu or 304-293-9924 to discuss your training needs.

JANUARY

Basic Construction Maintenance Math (Full-Day, RS I Class) Tuesday, January 28, Princeton

Common Sense Solutions to Intersection Safety (Full-Day, RS II Class) Wednesday, January 29, Charleston

Road Safety 365 (Full-Day, RS I Class) Thursday, January 30, Charleston

FEBRUARY

Effective Business Writing (Full-Day, RS II Class) Thursday, February 13, Burlington

ATSSA Flagger Certification Class (Four-hour, RS I Class) \$25 government agencies \$50 private agencies Wednesday, February 19, Morgantown

MARCH

RS II Accident Investigation and Reconstruction (Full-Day, RS II Class) Tuesday, March 4, Burlington

RS II Access Management (Full-Day, RS II Class) Wednesday, March 5, Burlington

ATSSA Flagger Certification Class (Four-hour, RS I Class) \$25 government agencies \$50 private agencies Wednesday, March 12, Wheeling



WV LTAP Image



Best wishes for the holidays and coming year.

The WV LTAP Staff Andrew, Ashley, John, Kim, Ron, and Sabrina

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