WV LOCAL TECHNICAL ASSISTANCE PROGRAM

COUNTRY ROADS & CITY STREETS

VOL.38 NO. 1 WEST VIRGINIA UNIVERSITY® BENJAMIN M. STATLER COLLEGE OF ENGINEERING AND MINERAL RESOURCES SPRING 2023

2023 PLANNING & GOALS

Kim Carr, WV LTAP

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Spring is here and it's the perfect time to share our goals for the rest of 2023.

The **Work Zone Sign Package Program** is coming back this year! The WV LTAP's popular work zone sign packages include traffic drums, barricades, cones, signs, and more. Applications will be available late spring/early summer. Please check the WV LTAP website at wvltap.org for more information or contact Kim at kim.carr@mail.wvu.edu.

We are in the process of replacing current equipment, including our radar traffic counters and radar speed sign, in our **Equipment Loan Program**. We are also adding brand new items that will be available for loan. Stay tuned for more information!

On the **training** front, our priority is to continue to offer both virtual and in-person training on a variety of topics: ATSSA Flagger Certifications, Work Zone Safety, Chainsaw Safety and Operation, Drainage, Effective Public Speaking, and more. A new Roads Scholar I class on vegetation/invasive species control is planned for this summer. This is a class that we are partnering with WVU Extension Services to develop and offer. We are also working with the Regional Intergovernmental Council (RIC) on a virtual grant writing class, which will be offered in pilot form this summer.

The **Snow & Ice Control Workshop** will be offered in-person on September 21, 2023 in Summersville. Please mark your calendar and let the WV LTAP staff know if there are specific topics you would like to have on the agenda.

ltap West Virginia

WV Local Technical Assistance Program

THIS ISSUE

WestVirginiaUniversity.
BENJAMIN M. STATLER COLLEGE OF ENGINEERING AND MINERAL RESOURCES

WV Local Technical Assistance Program

The **2023 Roadway Management Conference (RMC)** is scheduled for October 17-19 in Seven Springs, PA. The RMC is a great opportunity to learn from your roadway agency/public works peers from multiple states. Check out https://roadwaymanagementc.wixsite.com/home.

Country Roads & City Streets is going to a twice a year printed and electronic publication, with spring and fall publications. We have a goal of distributing our electronic newsletter, ***Road & Street Speak***, on an every-other-month schedule. Previous editions of both of these newsletters are also available on our website.

If you need to update your information or sign-up to receive information, please complete our online form, **https://www.wvltap.org/newletter-sign-up.** Regularly viewing our on-line training calendar and receiving our electronic newsletter are two of the best ways to keep up with available training. As always, please reach out to us with any questions, training topic suggestions, or to schedule a training or personalized technical assist.

BIL INFRASTRUCTURE FUNDING

West Virginia is set to receive a significant amount of funding from the Bipartisan Infrastructure Law (BIL) that was signed into law on November 15, 2021. Some of the key projects and initiatives that will be funded in West Virginia include:

Roads and Bridges: The state will receive $3.9 billion to repair and upgrade its aging roads and bridges. The law provides $3 billion to complete the Appalachian Development Highway System, which will help improve connectivity and access to economic opportunities in the region.

Electric Vehicle Charging Stations: $5 million to install electric vehicle charging stations along key corridors

Water and Sewer Systems: $1.2 billion to improve water and sewer systems.

Public Transportation: $39 billion for public transportation to help improve and expand transit services

Resilience and Climate Adaptation: The law provides $50 billion to improve the resilience of infrastructure to the impacts of climate change. West Virginia will be able to use this funding to address issues such as flooding and erosion.

Many of the BIL grants and infrastructure funding sources are available to local agencies, MPOs, and others. You can easily access BIL information from the WV LTAP website at wvltap.org. We have direct links to webinar recordings, fact sheets, available funding opportunities, and more. If you are a West Virginia local agency that receives BIL funding, please let us know! We'd love to learn more about what your project involves and how the BIL funding is making your project a reality.

ROADS SCHOLAR 1 GRADUATE

Scott Shannon, WVDOH Transportation Crew Chief

Scott was awarded his RS1 Certificate by Wetzel County Highway Administrator Everett Neff. Scott has been with District Six since September 19, 2016; he was promoted to Crew Chief in 2020.

Congratulations Scott for completing the Roads Scholar I program!

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2023 BUILD A BETTER MOUSETRAP

Celebrating Public Works Innovations

Share Your Creative Solutions

Roadway and street department employees are a very creative and resourceful group — skilled at problem-solving and finding ways to make things work. This is where the WV LTAP's Build a Better Mousetrap recognition program comes in to play. We want to celebrate, showcase, and share these creative ideas!

Creative Solution Examples

- A locally relevant product, tool, gadget, or an equipment modification
- A refined process or technique
- A technological innovation
- A unique use of new tools such as drones, apps, computers, smart phones, tablets
- And more...

Ask Yourself

- Did the solution provide an improvement in your roadway agency/street department activities? For instance, in the areas of maintenance, construction, contracting, inspection, finance, etc.
- Did it enhance safety, reduce costs, and/or improve efficiency?
- If your answer is yes to any of these, please submit your ideas.

Judging

Entries will be judged by WV LTAP staff and representatives from the WV LTAP Advisory Board using the criteria of

- Cost savings benefits to the community and/or agency
- Ingenuity
- Transferability to others
- Effectiveness.

Winners will be recognized in this newsletter and receive a prize. Additionally, the winning entries will be submitted to the national Build a Better Mousetrap recognition program that is conducted by the Federal Highway Administration. Winners of the national program will be announced at the annual LTAP conference this summer.

Submit Your Entry

We would love to receive your Build a Better Mousetrap entry and be able to help share your innovative ideas. We want to make this process as simple as possible. If you need assistance completing the brief entry form, taking photographs, or shooting videos, the WV LTAP staff can help!

The deadline for submissions is May 19, 2023. To submit your entry, complete the form at the WV LTAP website **wvltap.org/mousetrap.**

If you would prefer to submit your entry by paper copy, please email kim.carr@mail.wvu.edu or call 304-293-9924.

To help get your creative juices flowing, take a look at the innovative examples from other states on the following pages and visit **wvltap.org/mousetrap** to learn about previous WV entries.

The WV LTAP staff also encourages you to review past Build a Better Mousetrap national entries from across the United States that have been compiled by FHWA. There are some wonderful ideas that have been implemented in many different states!

https://www.fhwa.dot.gov/clas/babm/

Tools or Gadgets • Equipment Modifications • Improved Processes or Procedures • Software

BUILD A BETTER MOUSETRAP IDEA FROM PA

Hydraulic Powered Concrete Mixer - North Manheim Township, Schuylkill County, PA

Photos by North Manheim Township, Schuylkill County, PA

What was the challenge?

We do a lot of catch basin repairs, pouring of headwalls, and other concrete work. Our off-the-shelf options were to mix by hand with a wheelbarrow, which can be labor intensive and slow; use an electric mixer, which requires hauling a generator and fuel to the jobsite; or use a gas-powered mixer, which requires another engine to maintain and hauling fuel to the jobsite. We weren't satisfied with these options.

How did you develop and implement your solution?

All of our trucks are built with central hydraulics, so we decided to convert an electric mixer to hydraulic. We removed the electric motor, fabricated a mount to install a hydraulic spinner motor, added a safety shut-off valve, and had long hydraulic lines made to hook to the spreader or spinner hydraulic hook-ups at the back of the trucks. We purchased a suitably sized pulley from Tractor Supply and the correct belt from a local hardware store to complete it. Since those hook-ups already have adjustable flow for controlling salt usage, we were able to adjust the speed of rotation on the mixer. Now we don't have to haul any extra fuel or a generator to the job site. We don't have to worry about getting a small engine to start, and we don't have to break our backs mixing by hand.

What labor, equipment, plans, or materials did it take to make the solution work?

A used electric mixer, hydraulic spinner motor, V belt pulley, V belt hydraulic lines and fittings, hydraulic safety valve, random sheet metal laying around to build the mount and about 8 hours of labor.

What was the cost of implementation?

Our costs included: a used mixer - $100, pulley - $20 belt - $15, and hydraulic lines/fittings - $90.

The hydraulic spinner motor and hydraulic safety valve were already in stock and not planned to be used in the near future. Labor was ~ $200. The total cost was $425.

What was the positive impact of your efforts?

Not running a gas engine or generator saved us fuel costs and resulted in reduced emissions/pollution. Time was saved from not having to perform maintenance on the engine/generator or having difficulty getting them started. Not having to hand mix saved on labor. The main benefit for the crew is simply convenience. Just hook the lines to the truck and you're done.

The WV LTAP uses these same five questions for our Build a Better Mousetrap entries. We're also available to help with your write-up and entry submission!

BUILD A BETTER MOUSETRAP IDEAS FROM CT, & MT

Sand/Salt Loading Ramp Helps Reduce Chemical Spillage - City of Waterbury, Connecticut

Photo by City of Waterbury, CT

In Waterbury, CT severe winters require strong snow fighting chemicals to treat roadways. These harsh chemicals, especially the chlorides, have not only an effect on the environment, but residents began to see an impact on their drinking water. The public works department identified the salt shed as an area of improvement as plow trucks are quickly loading and unloading, making spillage and errors of the chemicals inevitable.

When the new facility was designed, the public works department wanted to ensure a permanent ramp would be created to mitigate spillage and any seepage before it could get into the groundwater. Utilizing materials on hand, the ramp was created with pavement and large pre-cast blocks that are banded together with steel plates. The ramp was moved adjacent to the salt piles, making it a shorter distance for the load operator to walk with full buckets. Any spillage that liquidates will drain into a catch basin that can be filtered and intercepted as needed before entering the sewer system.

Photo by Ravalli County, MT Road Department

Snowplow LED Taillight Air Diverter - Ravalli County, Montana

In Ravalli County, MT the newer snowplows were equipped with LED taillights that were not warming up enough to melt the snow packed in the back of the snowplows. This led to visibility problems for the drivers making it unsafe for them and other drivers on the road. Valuable time was also being wasted as the drivers would have to get out of the vehicles and manually wipe the snow away.

To increase visibility, the Ravalli County Road Department realized they needed to increase air flow over the flat surface of the tailgates. Using an 8 x 5-inch 90° rubber boot to compress air, the air is channeled to move directly over the lights with an air diverter. This allows for the warm air to be reused to melt the snow on the back of the snowplow.

The tubing was created for under $100 using tubing and mounting pins. The mounting pins made the tubing easily added to existing plows and removable when not in use. The air diverted ensured a safe and efficient process of clearing the roads of the dangerous snow.

SAFETY BRIEF

Trenching & Shoring Basics

Excavations and trench cave-ins account for a growing number of fatalities and serious injuries in construction. Such accidents seldom have a single specific cause. Usually, there is a series of separate, yet related, causes resulting from such factors. With little or no warning, an improperly sloped, shored, or shielded trench or excavation may collapse, trapping the workers below in seconds.

Active measures on the part of everyone to prevent cave-ins and other job accidents will pay big dividends for everyone. The following is an overview of excavation and trench safety basics to make you more aware of responsibilities when working in, near, or around excavations or trenches.

Planning for safety begins before you dig. You will need to know about traffic conditions, nearness of structures and their conditions, types of soil, ground water, overhead and underground utilities and the weather. Other conditions can be determined by jobsite studies, observations, test borings and by consultations with local officials and utility companies.

You must locate any underground installations, such as sewer, telephone, water, fuel, cable TV and electrical lines. If underground utilities are encountered in the digging, they must be properly supported and the contractor must contact the utility companies involved and inform them of the proposed work.

Once you have the preliminaries completed, your safety requirements should be planned to protect the public, the employees and property. Planning and following through with the plan is the first important step to safety in excavations and trenching operations.

Current OSHA regulations require that all excavations over 5 feet deep be sloped, shored, and shielded. When soil conditions are unstable, excavations shallower than 5 feet must also be sloped, supported or shored.

You may have heard the term: Angle of Repose. This is a method of ensuring safety in an excavation or trench by sloping the sides of the cut, to the angle of repose which is the angle closest to the perpendicular at which the soil will remain at rest. The angle of repose varies with different kinds of soil and must be determined on each individual project.

When an excavation has water conditions, silty material, or loose boulders, or when it's being dug in areas where erosion, deep frost, or slide planes are apparent, the angle of repose must be flattened. Various types of soil have varying degrees of angle of repose. Generally, a qualified engineer must determine the proper angle of repose for the specific type of soil condition.

A second method of support is shoring-sheeting, tightly placed timber shores, bracing, trench jacks, piles, or other materials installed in a manner strong enough to resist the pressures surrounding the excavation.

You may also use a trench box, which is a prefabricated movable trench shield composed of steel plates welded to a heavy steel frame. A trench box may be used as long as the protection it provides is equal to or greater than the protection that would be provided by the appropriate shoring system.

The soil structure must be carefully identified. Excavations in wet soil, sandy soil or areas that have been backfilled are relatively unstable and must have strong support. Even hard rock sometimes can be hazardous as faults in the strata can make it unstable when cut.

Changing weather conditions and climate also greatly affect how strong shoring systems must be. Excess water from rain or melting snow loosens the soil, drastically increasing the pressure on the shoring system. A rainstorm can turn a stable trench side that required only light bracing into a mass of loose soil, posing an immediate threat to the employees working within.

Shoring frozen ground presents another potential problem; a sudden thaw can undermine an entire section of shoring. Even excessively dry conditions can reduce the cohesiveness of the soil. Large excavations, in particular, are subject to changing weather conditions because they are generally open for longer periods of time than trenches.

When using shoring, workers should install starting from the top of the trench or excavation and working down. In installing the shoring, care must be taken to place the cross beams or trench jacks in true horizontal position and to space them vertically at appropriate intervals. These braces also must be secured to prevent sliding, falling or kickouts. Installing the shoring should closely follow the excavation work. It's dangerous to allow trenches to remain unshored even if no work is being done in them. Dirt walls will slough off, causing dangerous overhangs.

The longer a trench is left unsupported, the greater the chance of a cave-in. In some cases, the contractor will have to guard against an unstable excavation bottom, such as below the water line. Sheeting may have to be driven below the bottom of such an excavation to add to the soil stability.

Shoring systems must be inspected daily by a competent person. Inspections also are required after rainstorms or any change in conditions that can increase the possibility of a cave-in or slide. If dangerous ground movements are apparent, such as subsidence or tension cracks, all work in the excavation must be stopped until the problem has been corrected. In case of an emergency, workers must be able to leave the trench quickly.

When employees are required to be in trenches 4 feet deep or more, adequate means of exit, such as a ladder or steps, shall be provided and located so as to require no more than 25 feet lateral travel. Ladders must be in good condition, extend from the floor of the trench to 3 feet above the top of the excavation and be secured at the top.

As soon as the work is completed, the trench should be backfilled as the shoring is dismantled. After the trench has been cleared, workers should remove the shoring from the bottom up, taking care to release jacks or braces slowly. In unstable soil, ropes should be used to pull out the jacks or braces from above.

A greater awareness of the safety problems to be overcome in excavations, particularly by the individuals who design and install the shoring, will help end cave-in hazards in the construction business. There can be no short cuts or risk taking. It's a responsibility of every individual on the jobsite associated with excavations and trenching operations. Safety is just too important not to follow the rules.

OSHA standards require that a competent person inspect the trench daily and as conditions change. (An OSHA "competent person" is defined as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them." [29 CFR 1926.32(f)].)

Iryna Melnyk/Bigstock.com

Slope It. Shore It. Shield It.

WHAT NOT TO SAY

Guidance for Liability Neutral Language (Part 1)

Ron W Eck, P.E., WVU Professor Emeritus & WV LTAP Director

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Given the importance of language in minimizing liability risk exposure, we will be presenting key elements from the NCHRP *Digest* in a two-part series. This newsletter issue focuses on words and what not to say. In the next issue of the newsletter, we will look at policy and operational considerations such as making sure the language in agency guidance documents matches field conditions.

BACKGROUND & INTRODUCTION

State and local road agencies generate a variety of documents, including manuals, policies, studies, memoranda and emails. Such documents can be used by litigants and courts as evidence regarding the standard of care or duties for road agencies who are sued for alleged negligence in the operation of transportation facilities. These documents may use language and phrases such as "hazardous" and "high-risk " that have derogatory meaning in the legal system as opposed to more neutral and objective language. Language that is not neutral can increase the potential for roadway agencies to be found liable for damages in lawsuits.

Almost all written communications prepared within a public agency are accessible through public records requests and during the litigation process, so it is always important to use accurate and precise language and avoid language that contains opinions, inaccuracies, or conclusions.

In July 2020, the National Cooperative Highway Research Program (NCHRP) published *Legal Research Digest 83—Guidelines for Drafting Liability Neutral Transportation Engineering Documents and Communications Strategies.* The *Digest* includes information on how to write documents clearly and promotes the use of direct, objective and fact-based writing to avoid language that can have legal implications. The pdf of this publication is available at: http://nap.nationalacademies.org/25894.

RECOMMENDATIONS FOR LIABILITY NEUTRAL DOCUMENTS & COMMUNICATIONS STRATEGIES

Choosing Each Word Carefully

Words such as "hazardous", "dangerous" and "unsafe" tend to create the potential for liability, due to what is implied. For instance, the words "dangerous" or "unsafe" when used to describe a condition of the road imply that if the specified feature of the roadway is improperly maintained or in need of imminent repair, the road, rather than driver error, is at least partially at fault for an accident. Those words can imply that an agency is careless or negligent if it has not remedied the condition before an accident that may relate to the condition occurs.

While the following list of words from the *Digest* is comprehensive, it does not include all the words that can create unintended liability or responsibility for an agency.

Common Words & Phrases to Avoid	
• Better	• Clearly
• Concern	• Danger/Dangerous
• Deficient	• Edge/Shoulder Drop Off
• Ensure	• Essential
• Excessive	• Hazard
• Hot Spot Trap	• Imperative
• Inadequate	• Insufficient
• Is needed	• Mandatory
• Obstacle	• Poor
• Problem	• Require
• Risk/Risky	• Shall
• Should	• Trap
• Unsafe	• Worse

The Digest notes that even some “liability neutral” words may create liability for the agency, given the context in which they are used. Therefore, neutral words must be considered in context to determine the risk of liability with their use. The following lists illustrative words that provide flexibility.

Context Sensitive Liability Neutral Words and Phrases	
• Application of engineering judgement	• As soon as practicable
• Criteria/factors that may be considered	• Consider
• Can	• Candidates for shielding
• Could	• Difference in elevation rather than edge drop off or shoulder drop off
• Factors that contribute to the probability	• Guideline
• May	• Normal
• Potentially contributing factors	• Roadside feature, condition object, or device rather than hazard or risk
• Strategy	• Toolbox
• When/Where feasible	

Example

A guide (published by a government agency) for local municipalities

In describing things that can be done to improve safety on local roads, the guide states “Reduce crash severity by designing appropriate slope/ditches and removing "hazardous" roadside obstacles.”

The guide is considered authoritative with respect to local roads. The word "hazardous" suggests that if a roadside feature is not properly maintained, the road may be at fault for a crash. Such words can further imply that an agency is careless or negligent if it has not reduced the condition before a crash that is potentially related to the condition occurs. When a respected organization acknowledges that roadside obstacles create a dangerous condition of the roadway, it creates a liability risk for local road agencies. The sentence could be made liability neutral by simply removing the word "hazardous."

Avoid Using Vague Phrases

Phrases such as "consideration should be given” and “wherever possible” may appear to provide flexibility to an agency. Even though they seem to simply emphasize the importance of the instruction, they also in essence require action to be taken.

Factual information and descriptions that allow the practitioner to use engineering judgment to make a decision are more useful and allow the use of discretion in performing the work.

Example

Two state highway agency maintenance manuals

State A Maintenance Manual

The Department, when fencing, regardless of specific ownership, is damaged by an errant vehicle that has left the pavement of a State Highway and livestock is present, is authorized to give notice to the property owner; notify HP; complete a temporary repair while the owner is responding; and repair the fence if the situation seems too dangerous. The property owner or damaging party will be billed for the repairs. Repairs made to non-Department fence will meet the minimum Department standards.

State A’s policy contains language that is not clear: “[t]he Department, when fencing, regardless of specific ownership, is damaged by an errant vehicle that has left the pavement of a state Highway and livestock is present, is authorized to give notice to the property owner; notify HP; complete a temporary repair while the owner is responding …” This sentence is critically important to the process and should be changed to identify the parameters of the agency’s responsibility.

State B Maintenance Manual

Inspection and Repair of Fences and Gates

1. Activity Description. This activity includes maintaining or replacing fence posts, top rails, and gates of department-owned fences. Interstate fencing is the responsibility of DOT. All other fences are the landowner’s responsibility unless a right-of-way agreement states otherwise. Cleaning dirt and materials from state-owned fences is included in this activity.

2. Purpose. The purpose of this activity is to protect the safety of the public by keeping livestock off the highway and ensuring that controlled access is maintained.

3. Timing of Maintenance. Fences should be inspected twice a year and needed repairs and maintenance scheduled. Fence and gate damage should be scheduled for repair as soon as practical.

The standard of care is the criteria by which reasonableness is judged. For example, the Manual on Uniform Traffic Control Devices (MUTCD) is the standard of care for signs and markings on roads open to public travel. Other standards of care with respect to roadways include the AASHTO Policy on Geometric Design of Highways and Streets (the Green Book) and agency policies, directives and manuals.

State B's maintenance policy on fencing is consistent with the principles described herein. Note that State B sets a specific schedule for fence inspection (twice a year) but provides flexibility within the policy to allow repairs to be done "as soon as practical." On the other hand, State A instructs its staff to repair a fence "if the situation seems too dangerous." When the word "dangerous" or "hazardous" is used, maintenance staff is left to determine how dangerous is "too dangerous." And who has to decide when it's "too dangerous?" How and when is that decision made?

Surplus Language

Surplus language can be words that are redundant or duplicative or words that seek to explain a concept that does not require explanation. Surplus language can impact the clarity of an idea or provide a plaintiff's lawyer with a theory of negligence that would not have been apparent from a clearly written sentence.

For example, let's look at another sentence from the previously mentioned guide for local municipalities. The guide suggests that one of the ways for giving road users appropriate information so they can navigate roadways is "Remove visual obstructions as much as you can." "As much as you can" is vague and it is not clear how much work should be done to remove obstructions. But with regard to the subject of this section, the phrase "As much as you can" is surplus language.

The advice to maintenance crews should be to remove visual obstructions. The "as much as you can" phrase is not needed and could, in fact, provide a plaintiff's attorney with a theory of liability against the road agency.

Example

Vision Zero

Vision Zero is a concept that has been accepted by hundreds of cities in the United States. The agencies work towards the goal, based on data-driven strategies, of achieving zero serious injuries and deaths on their roadway systems. City C makes this statement on its website:

"The primary responsibility of the City government is to ensure the safety and well-being of all of the city's residents. One death on our streets is one too many."

This language suggests that the government itself is "ensuring" the safety of all its residents. This is not an appropriate legal standard of care. A roadway agency's legal duty is to provide reasonably safe roads, not to ensure the safety of all road users. The sentence could be eliminated entirely or replaced with a sentence that simply sets out the facts, such as "In the last ten years, there have been 74 deaths and 542 serious injuries on our roads. Our goal is to reduce the number of deaths and serious injuries every year."

In this article, we looked at what not to say in agency-related writing and speaking. Part 2, in the next issue of the Newsletter, will address what not to do in terms of liability neutral language in policy and operational matters. If you are interested in the broader topic of the legal exposure of and risk management for road agencies, WV LTAP offers a 6-hour class (offered in-person or virtually) on Tort Liability and Risk Management. If you are interested in scheduling this class for your agency, contact Kim Carr at WV LTAP.

TRAVELING THROUGH INVASIVE PLANTS

A Description of Three Common Invasive Plants of the Mid-Atlantic Region and Management of These Pests Along Transportation Rights-of-Way

James Watson, West Virginia Department of Agriculture

Close-up of a leaf and fruit cluster from the tree-of-heaven and a mature tree shown below.
Photos used with permission of James Watson, WV Department of Ag.

Non-native, invasive plant species have caused significant damage to America's forests, agriculture, residential landscapes, and more. These plants often lack natural control mechanisms found in their native habitats and thus proliferate at an alarming rate when introduced. Control of these plants can be difficult and costly. These plant species tend to be opportunistic in nature and often invade areas where natural vegetation has been removed. Since many of these plant species were originally introduced into the United States for ornamental use, infestations of these species tend to be most prevalent around urban centers. Due to the habitat created along transportation rights-of-way and the ability of seeds to be dispersed via transportation modes, many transportation corridors are lined with non-native, invasive plant species. These species not only reduce the health of the local ecosystems but are often costly to maintain along the right-of-way as well. In this article, identification and management of three common plant invaders of transportation corridors will be discussed.

Tree-of-Heaven

The tree-of-heaven (ailanthus altissima) is the most common tree species lining travel corridors in many areas.
This tree is from China and is tolerant of a wide array of growing conditions. Tree-of-heaven spreads by both seed and root sprouting. In many localities, tree-of-heaven is confused with black walnut (Juglans nigra) and sumacs (Rhus spp). The tree-of-heaven leaves are pinnately compound and comprised of a long stem with many leaflets. A few of the leaflets have a couple large teeth along the margins and each tooth has a conspicuous gland on the underside that emits a foul odor when crushed. The fruits are dry and papery and change in color from orangish during the summer to brown in the winter. The stout twigs also emit a foul odor when broken or crushed.

Tree-of-heaven aggressively resprouts after being cut so mechanical control of this plant is not advised unless combined with applications of herbicide. Herbicide products that contain the active ingredients triclopyr, glyphosate, and imazapyr are effective at killing tree-of-heaven. It is important to be persistent with tree-of-heaven removal efforts as a second application of herbicide is often necessary to effectively remove it. This extra cost is worthwhile, as future cuttings and applications can be reduced if the infestation is eradicated. Also, removing all tree-of-heaven in the right-of-way is advised to prevent reinfestation into areas where removal has been achieved. It is also important to allow native vegetation that will not interfere with the transportation corridor operations to remain intact to prevent tree-of-heaven from gaining a foothold. Allowing smaller sized, native plants to proliferate will help to control erosion, provide habitat for native wildlife, and choke out larger sized plants such as tree-of-heaven that are costly to manage. Tree-of-heaven also boosts populations of the invasive insect pest, spotted lanternfly (Lycorma delicatula).

Bradford Pear

The Bradford pear (Pyrus calleryana) has invaded many locations throughout the Mid-Atlantic region and beyond. In the spring, Bradford pears are covered in white flowers that have a foul odor. The leaves are shiny green, and the margins are finely serrated. In the fall, Bradford pears turn all shades of orange, yellow, and red. Once a valued landscape tree, Bradford pear is now a weed that is costly to manage. The plant will tolerate extremely poor growing conditions and covers many acres of land within transportation corridors.

Bradford pear produces few, if any, root sprouts. The species does, however, produce extraordinary amounts of seed each year and therefore quickly amasses a huge seed bank in the soil. This means that even if the infestation is killed via herbicides, new trees can quickly sprout and reinfest. Since the cut stumps of Bradford pear are capable of resprouting, herbicides should be applied to the cut stumps. Productivity of native vegetation suitable for the height requirements of the right-of-way should be encouraged to hamper the success of new seedlings that will invariably appear after treatment. New seedlings should not be allowed to reach maturity and produce seed. Remaining Bradford pears used as ornament in interchanges, etc. should be removed to reduce the seed source.

The Bradford pear tree produces white flowers in the spring.
Photo used with permission of James Watson, WV Department of Ag.

Bradford pear trees were often used as ornamental plantings, but the growing, selling, and planting of these invasive trees is being banned in some states starting next year.
Photo by Bernardine S. Stevens, Bigstock.

This photo depicts a roadside infestation of Bradford pear trees.
Photo used with permission of James Watson, WV Department of Ag.

This photo shows the spread of Japanese Knotwood on the side of a roadway.
Photos used with permission of James Watson, WV Department of Ag.

Japanese Knotweed

Japanese knotweed (Fallopia spp.) has extensively invaded transportation corridors throughout the northeastern and Mid-Atlantic regions of the United States. Japanese knotweed is a non-woody herbaceous perennial plant in the Polygonaceae family and is native to east Asia. The plant reaches 9-11 feet in height and creates vast monocultures through underground rhizomes. The leaves are spade or heart-shaped with smooth margins. The stems of the plant are hollow and persist through the winter months.

Severe Japanese knotweed infestations are generally not removed through one herbicide treatment. Rather, a late season application of herbicide containing the active ingredients glyphosate or imazapyr, followed by an additional application during the following growing season is generally required to get Japanese knotweed under control. The site should be monitored in subsequent growing seasons for reinfestation and treated accordingly.

Controlling Invasive Plant Species

Understanding the physiology of invasive plant species is paramount to effectively controlling them in a cost-effective manner. Reducing the habitat for invasive species as much as possible can, in turn, reduce future maintenance costs. Selectively target and treat non-native plants that will interfere with travel corridor maintenance, clearance, and other operations and instead encourage native vegetation of appropriate size to dominate the site and hamper growth of unwanted invasives.

It is often worth the cost to go the extra mile in controlling these pests to reduce overall costs long-range. Effectively controlling invasive plants along travel corridors

- improves aesthetics
- boosts native plant populations
- improves ecological health of the region
- reduces the spread of both plant and insect pests via transportation modes
- and reduces long term right-of-way maintenance costs.

QUICK FACTS...

While **Bradford pear** trees produce pretty flowers, the aroma is anything but sweet. The flowers emit a foul smell that some compare to the smell of rotting fish, urine, or excrement.

Japanese Knotwood thrives in riparian habitats (next to rivers and streams), completely covering miles of stream and river banks.

extension.wvu.edu/lawn-gardening-pests/weeds/japanese-knotweed

"Like the famed Hydra of Greek myths, you cut a **tree-of-heaven** down and it sprouts multiple new "heads" from its roots. ... Consequently, loggers need to avoid cutting this tree without applying a herbicidal treatment to kill the root system. Leaving a few cut trees in a forest or near a forest edge may lead to a rapid displacement of the existing forest that was once there."

wvdnr.gov/plants-animals/exotic-and-invasive-species/top-invasive-plants/

CUSTOMER SERVICE ESSENTIALS

This content is from an article that Bettina Seitz wrote for the UNH T2 Road Business Newsletter Spring 2021 edition and has been shared by the NLTAPA Communications Work Group. Reprinted with permission.

HAVE A PLAN IN PLACE – AND KNOW YOURSELF

- How will you detach yourself from your own emotions and focus on the situation at hand? You don't necessarily know the other person's "story" or experiences, so it helps to keep judgement at bay. Put yourself in the other person's shoes.
- What do you know about yourself — your triggers, your own biases or experiences, your approach to stressful situations — that you can plan to manage to help you through the interaction or otherwise be aware of?

START BY LISTENING & GIVE THEM TIME TO TALK

- Listen actively to the complaint. Try to attend to the problem without already formulating an answer in your mind. Reflect the complaint, or if you don't fully understand it, ask for more detail. ("Tell me a bit more about this, so that I can understand better.")
- Try not to interrupt or talk over the angry customer. Patience is a virtue in customer service settings. People need time to express how they feel. Be empathetic.
- Do not try to promise to fix the situation as you might not be able to. The key is to make your customer feel heard and understood. As important, follow up if you are promising to follow up. Do this reliably and in a timely manner. The more time passes, the angrier someone might get.
- Do not try to justify or contradict at this moment. The customer is venting and needs to be heard.

REMAIN CALM – YOUR SUPER-POWER!

- Being on the receiving end of a complaint that might have nothing to do with you can get the calmest person worked up. But it is just that…The customer's (natural) anger response has nothing to do with YOU personally. This is the mantra you want to repeat in order to remain calm.
- On the other hand, if the customer strikes out in a personal, rude or abusive tone, you don't need to tolerate that kind of behavior. Escalating this to your supervisor for additional support might be a good idea.
- Or just calmly say "I am happy to continue this conversation with you once you calmed down enough to not speak with me in this tone of voice. There is no need for name calling or foul language, I am here to help you."

THANK YOU GOES A LONG WAY

- It might be hard to do in certain situations but thank them for bringing a specific problem to your attention.You might have been unaware of this, and in the long run the customer voicing his or her concern will help you to approach problems proactively.

BE SINCERE AND SPECIFIC

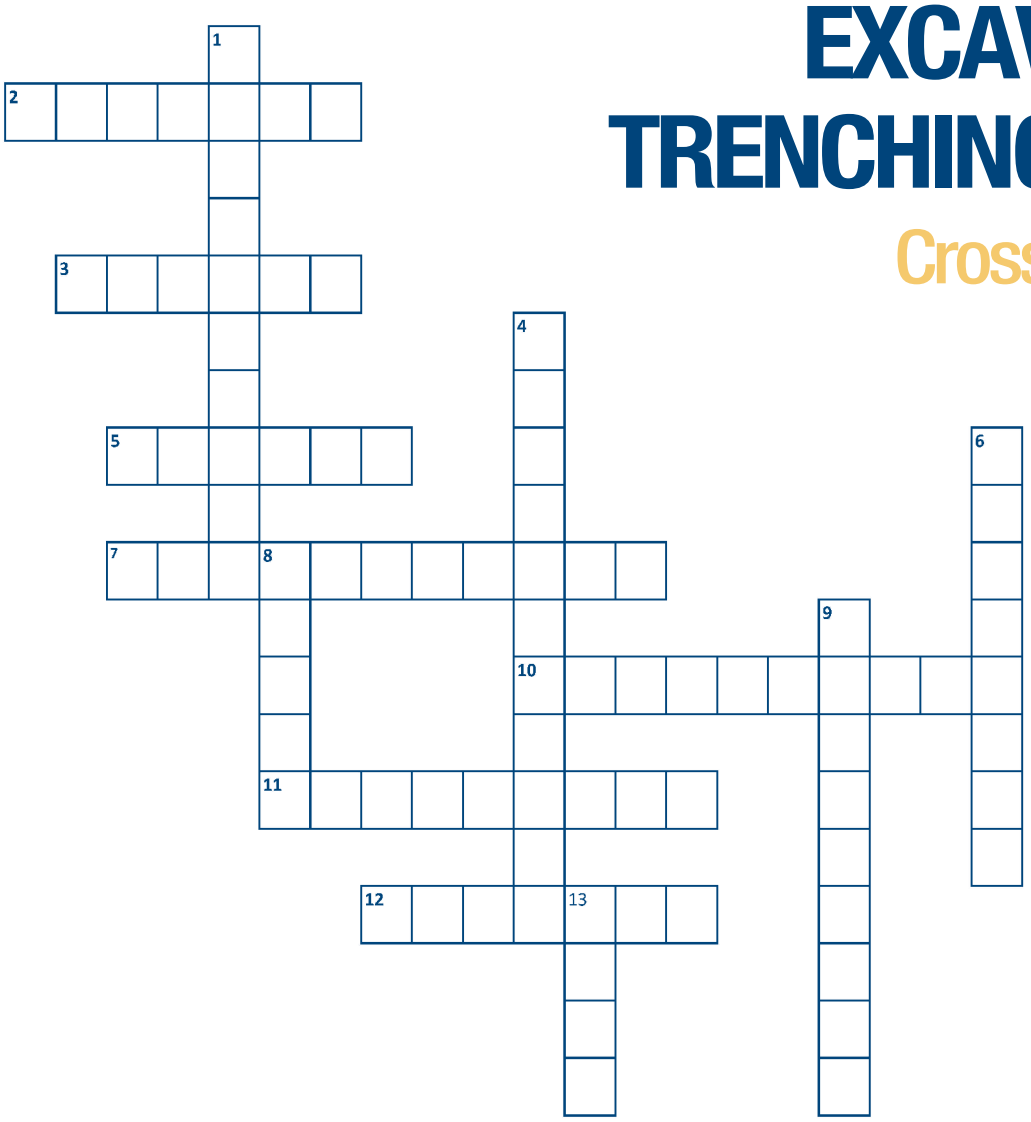
- When you are promising to circle back about an issue, please do it. Give them a timeline when they can expect to hear back from you. Highlighting the importance of the priority to resolve their issue might be a good tool to calm the angry customer.
- If it's a user error or misunderstanding on their end, try to steer away from pointing this out to them.

COMMUNICATION REALLY IS KEY

- If the issue is complex, and you need to pull in support of your supervisor, IT, etc., keep people updated on the steps you are taking and how you are planning to resolve the issue. It helps to "chunk down" a problem into bitesize solutions.
- Before you wrap up, clarify what next steps (or resolution if you've reached that) are, and be sure to be accountable to any follow-up or timeline for responding.

EXCAVATION & TRENCHING SAFETY

Crossword Puzzle



Test your excavation & trenching safety knowledge with this short crossword puzzle.

Check your answers on our website.

wvltap.org

ACROSS

2. Engineering controls, protective equipment and safe work practices can reduce _____ to workers.

3. Trenches 4 feet or more in depth should be provided with a fixed means of _____.

5. When it comes to trenches, OSHA says Slope It, Shore It, or _____ it.

7. The OSHA standard for excavations, including trenches, describes the _____needed for safe excavation work.

10. Between 2011-2018, _____ and trench cave-ins caused 137 deaths.

11. Never enter a trench unless it has been properly inspected by a _____ person.

12. Spacing between _____ must be such that a worker will not have to travel more than 25 feet laterally.

DOWN

1. Trenching standards require _____systems on trenches deeper than 5 feet.

4. Before entering a trench, check for problems and never enter an _____trench.

6. Trenches 20 feet deep or greater require a protective system designed by a registered professional _____.

8. One _____ yard of dirt weighs the same as a compact car.

9. Evaluation of the soil by a Competent Person to determine its _____ is essential to preventing trench collapse.

13. Soil and other materials must be kept at least 2 feet from the _____ of a trench.

COUNTRY ROADS & CITY STREETS
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The material and opinions included in this newsletter are those of the West Virginia LTAP and do not necessarily reflect the views of FHWA or the WVDOT. 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 MISSION
The mission of the West Virginia LTAP is to foster a safe, efficient, and environmentally sound transportation system which enhances the economic development of West Virginia by improving skills and increasing knowledge of the transportation workforce and decision makers.

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

WV LTAP SERVICES your TO DO LIST

- ☑ Read and share this edition of *Country Roads & City Streets*
- ☑ Submit a Build a Better Mousetrap Entry
- ☑ Contact WV LTAP staff to request training
- ☑ Visit the WV LTAP website weekly at wvltap.org
- ☑ Update your email and mailing information

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