What does operating a chain saw have to do with roadway safety? Roadway maintenance workers are often responsible for clearing brush or hazardous trees from roadways, rail trails, city parks, and high traffic areas. Thus, many roadway maintenance personnel operate a chain saw on a regular basis, all as part of their job. These roadway maintenance chain saw operators are responsible not only for their safety, but the safety of co-workers and passing motorists or pedestrians.

The past couple of years, the WV T² Center has received feedback from many of you that chain saw safety and felling is an area where additional training is both needed and wanted. Based on this feedback, the WV T² Center scheduled two separate chain saw safety and felling workshops - April 7 in Philippi and April 8 in Moundsville. The Center also partnered with the Maryland T² Center, and on April 5 an additional workshop was held in Cumberland, MD. This location helped reach those of you in the Eastern Panhandle.

The instructor for these sessions was Tim Ard, a nationally respected trainer in chain saw safety and felling. Combining classroom instruction with a tree felling demonstration, participants were provided the opportunity to see the importance of safety and planning in preventing chain saw injuries. Included in this edition of Country Roads and City Streets are two articles on chain saw operation from Tim’s Forest Applications Training, Inc. website. For those of you who operate chain saws, the T² Center hopes you find this information to be both useful and valuable.

The WV T² Center would like to thank Buddy Shreve and the City of Philippi for donating time, money, and a wonderful site to hold the April 7 workshop. The Center would also like to thank the West Virginia Division of Highways District 6 for hosting us at their facility. To Carol Ryan, a special thank you for all of your help with logistics, and to Delmas Robinson, thank you for your help in locating a tree. Finally, to the City of Moundsville, a huge thank you for hosting us and permitting Tim to cut a tree down on the rail trail after our original location fell through.

Tim Ard, along with some of the Philippi workshop participants, examines the stump of the newly cut tree.

At the Philippi workshop, Tim demonstrates to John Capicola and James Richmond how to gauge where the tree will fall.

Participants listen intently during the classroom portion of the Chain Saw Safety and Felling session.
**Tim’s Tips, Reducing Downtime.**

Keeping your chain saw in perfect operating condition is key to reducing downtime in your logging operation. During the workshops and visits to logging operations, I often find that saws are either unsafe to operate or are improperly maintained and tuned, causing them to be unsafe, run inefficiently and even wear out prematurely.

There are many things you can do to maintain your saw(s). If you are unsure how to make a repair or tune a saw, it is best to take it to a dealer. However, if you understand what to look for you will better know when your saw needs the attention of a trained professional.

The following is a summary of basic maintenance steps. Some of these need to be done weekly and others need to be done daily. Please refer to your owner’s manual for a list of daily and weekly maintenance schedules.

**Procedures for Reducing Downtime (RDT):**

1. **Air Filter** - Think of this as the chain saw’s nose. If the filter is not clean, the chain saw cannot run efficiently. Air filters should be cleaned with soap and water and should be dry before putting them back on the saw. Consider having more than one filter so they can be rotated. Do not use cleaning agents on the filter, such as ether, which will destroy the seals. Do not use mixed saw gas which will leave an oil residue that will collect and wear.

2. **Screws and Bolts** - Always check screws, nuts and bolts, especially after running a few tanks of gas through a new saw.

3. **Starter Cord** - Inspect starter cord daily. There should be some free play in the spring when the cord is pulled out completely. The cord should not be frayed and the handle should not be broken.

4. **Flywheel and Pawls** - The flywheel often collects debris which can cause it to become unbalanced. The flywheel and pawls can be cleaned with a toothbrush and an ordinary bathroom cleaner such as 409. While the cover is off, it is a good idea to clean the wires of the ignition. When these get dirty, the vibration of the engine can cause the wire to break.

5. **Saw Chain** - Inspect chain for cracks and wear.

6. **Bar** - Clean the groove. Heat generated along the bar will cook oil and chips into the rail. This should be removed daily or it will tend to clog the bar, making it difficult for the chain to pass over it and reduce effectiveness of the oiler. One way to help extend the bar life is to rotate the chains. You might consider owning three chains, which can be rotated on a daily basis. This will help the chain and bar wear at an even rate.

7. **Sprocket** - When the sprocket teeth at the end of the bar become sharp to the touch, they are worn out and should be replaced.

8. **Clutch, Drum, and Drive Sprocket** - The chain drive sprocket is made of case-hardened metal. If the fingernail can catch in the drive straps, the sprocket is probably worn out. The clutch is a spring clutch, which engages at approximately 3,000 RPM. The drum should be clean.

9. **Chain Catcher** - The chain catcher on the bottom of the saw must be in place to protect the operator from injury and the gas tank from rupture if a chain should be thrown off the bar.

10. **Chain Brake** - The chain brake stops the chain in the event of kickback. Most new brakes have an inertia function so the brake will engage even if the handle is not hit. The chain brake must be cleaned daily and can be checked by running the saw at full speed and activating the brake. The chain should stop almost instantly.

Tim’s Tips are a publication of the Illinois Pro Logger Program and are taken from information given in the training. Thanks to Mike Bolin of the University of Illinois Extension Service for writing and compiling the information. © 1998 Forest Applications Training, Inc. Reprinted with permission.
AN ACCIDENT? AN ARTICLE ON CHAIN SAW SAFETY...

By: Tim Ard, President of Forest Applications Training, Inc.

Step one
Make sure your chain saw is current. Professionals should update/upgrade their equipment to safe working standards. Saws today should be equipped with chainbrake, throttle interlock and saw chain stops. These items may be referenced in your owner’s manual or at your local Husqvarna chain saw dealer. When purchasing a saw and/or accessories, make certain you are aware of appropriate saw size, chain types and proper maintenance to insure safe operation.

Step two
The least expensive insurance you can purchase for reducing the cost of chain saw related injury is that of PPE. Personal protective equipment is required by OSHA for the saw operator on a logging job and because of this we should wear and use it, but it can also be the most profit saving investment you can make. Looking at injury statistics, fractures sustained from falling objects, trips, falls, and lacerations rank high on the accident list. Hardhats, eye and ear protection, chain saw protective mittens, leg protection, boots with protection from the chain saw and good traction limiting slips and falls, are common sense… insurance at minimum to reduce the severity of an accident’s injury.

Step three
Make a plan on each cutting task. Taking time to make a task-specific plan will possibly slow you down at first. However, time and again, either by preventing an accident from happening or by a more productive way of doing the task, that hesitation to make a plan increased production.

Is it an accident? I guess we should look at a definition to begin. What is an accident?

The American Pulpwood Association has given an accident prevention, domino formula, presentation for years to loggers and risk managers of all types. One of the most embedded statements from this presentation in my mind is that, an accident is an unplanned event! If this is true, then planning is truly the best thing we can do to prevent accidents (at least those with injury), from happening. I believe this is true! I have asked loggers across the nation (who told me of injuries they or a member of their crew have sustained), “did you plan the injury?” To date, they have all said, “NO!” I guess this gives a substantiated truth to the statement.

Statistics show that operators of chain saws in the logging industry rank high in accidents. They’re tops in numbers of accidents and can be in volume of dollars expended in repair of them. Considering the above paragraph, we should look at the planning process of chain saw operation. Information should be taken and experience referenced before going further. Safe and productive techniques are no accident! They are results of planning.

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ACCIDENT? AN ARTICLE ON CHAIN SAW SAFETY CONT’d...

Whether felling or limbing and topping after felling, your position to and under hazards can be deadly. Look up to assess the tree, its top, and down around it. Broken or dead limbs, vines, adjacent trees growing or dead, can all produce situations that can affect our safety and production. On the ground, the treetop or log may roll. Make certain your position, footing and terrain you must travel through upon your retreat are clear and easily passable.

Hung trees and “struck by” situations are formed by falling trees not going exactly as planned. The lean(s), side, forward, and back, not calculated and compensated for at the time of planning and executing the fall, will surprise even the best of saw operators. If a tree leans to a side it may brush or even hang in an adjacent tree if not compensated for with the hinge and notch. This can unmistakably ruin a production day. Saw operators on the ground that must bring in other equipment (skidder, etc.) to take back leaning trees, will sometimes increase chances of injury to both operators. The information-taking process of establishing and calculating lean(s) is taken too lightly in the faller’s training process.

Felling accidents investigated have many times found the dead or injured operator within a fifteen-foot radius of the stump. This highlights the need for the chain saw operator to retreat from the tree as soon as the tree moves. A two to three step retreat or escape really doesn’t combat the stats. The sawer must consider a much further retreat. That path should be in a 45 degree angle from the fall of the tree. This means the operator should retreat not to the side and not directly behind, but to the rear of the fall in a 45-degree path, fifteen feet or more. Notching and back cut techniques selected should offer the operator ample time to retreat from the moving tree. (It’s when the tree begins its descent that many limbs and other form of debris begins its fall. As other trees are brushed or angles upset, a resting broken limb falls, striking the operator).

To steer the falling tree a directional notch and hinge should be placed on the desired direction face of the tree. The notch allows the hinge to work as it holds and guides the tree to the target, just as a hinge on a door guides it to the latch. Properly sized and placed, this notch and hinge can guide the tree to the desired location and away from or past adjacent trees or residual stands. This directional falling can greatly reduce the need to stay with or beside the tree to guide it by reducing holding wood. An important factor to the hinge working properly is a proper notch opening for the situation. If the notch is a thin, fifteen-degree pie, a forty-five-degree, or an open face of seventy to ninety degrees, it determines the angle or altitude and attitude of the tree when its steering hinge breaks or releases. Important: if the face notch is less than seventy degrees open or has a by-pass cut (mistake cut) in the notch area, you must have a back cut which is higher than the level of the notch. The thinner or smaller notch opening you have, the quicker the fibers of the tree and or hinge are stressed. This can mean loss of control, quality of the log, and reduced safety for the operator. Not understanding the use of hinges in felling and topping has attributed to many logging accidents and injuries. Often injury can be attributed to poor felling direction or a roll or quick reaction on the ground taking place.

We can cover specific techniques; however, the planning and mechanics of fiber and the hinge are the basis for explaining situational concerns. Review and remember the highlighted planning techniques above: hazards, lean, retreat, notch and hinge, specific plan.

A video is available discussing many techniques the professional saw user will find helpful. The video, “Sensible Wood Cutting” is available from your local Husqvarna dealer or by writing or calling the Forest Applications Training Office, PO Box 1048, Hiram, GA 30141. Phone 770-943-4745. You can also reach us through the internet at our website http://www.forestapps.com.

Article reprinted with permission from Tim Ard, President of Forest Applications Training, Inc. Photograph and graphic from the WV T’ Center collection.
NEW ADDITIONS TO THE WV T² CENTER LENDING LIBRARY

As a reminder, the WV T² Center possesses a lending library with many recent video, publication and CD-ROM resources. These resources may be checked out for a two-week interval by anyone; however, they are renewable once the two-week period has expired. These resources are helpful to anyone that works in the transportation (or related) field. There are instructional videos, interactive CD-ROMs, some of the latest federal government publications, among many others. Some of the categories of information available are: bridges, congestion, drainage, elderly drivers, finance, geotechnical, legal, miscellaneous, management, maintenance, pedestrians/bicycle, pavement, roads, snow control, safety, and traffic and signing. Included in this newsletter are some of the more recent publications that the T² Center offers. Feel free to call and request one of these resources, or a complete listing of resources in pdf format contained on a CD-ROM. For assistance, call or email Keith Bryant (304-293-3031 x 2662, kfbryant@mix.wvu.edu).

NEW VIDEOS

VIDEO # 279: SOME MISTAKES LAST FOREVER: WEST VIRGINIA LOGGER’S SAFETY VIDEO
A comprehensive logger safety video. Covers topics such as manual felling; limbing and bucking; skidding/yarding; loading and transporting; first-aid and emergencies.

VIDEO # 280: HIGHWAY WORK ZONE SAFETY: UTILITY SAFETY IN WORK ZONES
This program shows the above and below ground hazards of telecommunications, electric, gas, water and sewer utilities; the on-site consequences when they are disrupted; and the off-site consequences to those affected by the disruptions.

VIDEO # 281: HIGHWAY WORK ZONE SAFETY: MOVING OPERATIONS / MAINTENANCE SAFETY
This program describes a variety of short-term highway operations from snow plowing to patching, from least dangerous to the most dangerous. It emphasizes awareness of hazards and individual responsibility for safety where standard traffic controls are at a minimum.

VIDEO # 282: HIGHWAY WORK ZONE SAFETY: REMOVAL / DEMOLITION SAFETY
This program shows the hazards associated with the demolition and removal of roads, structures and utilities in preparation for new construction. The program emphasizes personal safety by being knowledgeable about the job, the equipment and the plan.

VIDEO # 283: HIGHWAY WORK ZONE SAFETY: PAVING SAFETY
This program shows some of the hazards of paving with PCC and ACC, including night paving operations. Emphasis is on taking personal responsibility for being aware of the changing hazards during paving operations.

VIDEO # 284: HIGHWAY WORK ZONE SAFETY: LOADING, TRANSPORTING AND UNLOADING HEAVY EQUIPMENT
This program shows the special considerations involved with moving equipment too large to be self-transported over long distances. Emphasis is on visibility and respect for the size of the equipment.

VIDEO # 285: HIGHWAY WORK ZONE SAFETY: SURVEYING SAFETY
This program describes some of the important hazards surveyors face as they work in every phase of construction, from pre-con to post-con, both inside and outside the work zone.

VIDEO # 286: HIGHWAY WORK ZONE SAFETY: PLANT SITE SAFETY
Helps to recognize the wide variety of hazards found around industrial plant sites. Examples of said hazards are mixed traffic, heavy equipment operation and chemicals / flammable materials stored around a plant.

VIDEO # 287: HIGHWAY WORK ZONE SAFETY: TRAFFIC CONTROL SAFETY
Teaches the fundamentals of proper procedures for installing and maintaining effective traffic control through a highway work zone. Also helps to recognize dangerous situations related to traffic movement through a highway work zone, and avoid unsafe activities.

VIDEO # 288: GETTING ACROSS: AQUATIC ORGANISMS AND ROAD-STREAM CROSSINGS (A BRIEF INTRODUCTION)
This short video illustrates why and how road-stream crossings are constructed to pass aquatic organisms. It is a very brief introduction to the subject intended principally for land managers.

VIDEO # 289: GETTING ACROSS: AQUATIC ORGANISMS AND ROAD-STREAM CROSSINGS (GENERAL OVERVIEW)
This video provides a general overview of aquatic organism passage at road-stream crossings. It is intended for people who want to broaden their understanding of the issue and its solutions.

Country Roads & City Streets, Vol. 19, No. 1, Spring 2004
NEW ADDITIONS TO THE LENDING LIBRARY CONT’D

NEW CD-ROMS

CD # CN03.2: TRB 83rd ANNUAL MEETING
Pre-print CD Rom, containing unedited versions of TRB papers.

CD # DR01.1: CULVERT MANAGEMENT SYSTEM (CMS)
A software package that allows roadway agencies to keep inventory and status of their culverts. Comes with software and user’s manual.

CD # DR00.1: MODERN SEWER DESIGN v2.0
A good resource for technical information on the design, installation, and maintenance of SCP Storm sewers.

CD # MN02.1: ASSET MANAGEMENT: TOOLS FOR IMPLEMENTATION
This CD contains a variety of informative materials in support of Transportation Asset Management activities: reports, software, presentations, publications, and fact sheets.

CD # SF02.4: FOREST APPLICATIONS EBOOK: THE COMPLETE GUIDE TO CHAIN SAW SAFETY & DIRECTIONAL FELLING
A comprehensive chainsaw guide written by one of the foremost experts, Tim Ard.

CD # MT03.1: ASPHALT PAVEMENT MAINTENANCE
This field guide provides guidelines for preventative asphalt pavement maintenance techniques for a variety of distresses and conditions.

CD # SA02.3: RED LIGHT, GREEN LIGHT
A 7min 30sec mp3 file that stresses the importance of driver and pedestrian cooperation at intersections.

PUBLICATIONS

Pub. # PV03.1: Asphalt Pavement Warranties Technology and Practice in Europe

Pub. # BR03.1: Innovative Technology for Accelerated Construction of Bridge and Embankment Foundations in Europe

Pub. # PB99.3: Accessible Rights-of-Way: Sidewalks - Street Crossings - Other Pedestrian Facilities

Pub. # TS03.4: Intelligent Transportation Systems & Winter Operations in Japan

Pub. # MC03.4: Meeting 21st Century Challenges of System Performance Through Better Operations

Pub. # MG03.1: Access Management Manual

Pub. # TS03.3: Traveler Information Systems in Europe

Pub. # TS03.2: Intelligent Transportation Systems Benefits and Costs

Pub. # RD02.2: Scenic Byways: A Design Guide for Roadside Improvements
The WV T^2 Center has limited copies of various publications, including pocket guides available on a first-come, first-served basis. Please contact Keith at 304-293-3031 x 2662 if you would like to request any of these items.

**Free Stuff from the WV T^2 Center**

**Road Symbol Signs**
How familiar are you with road symbol signs? Do you know which signs are orange? Yellow? Regulatory? Warning? Road signs are an important part of a safe roadway system. Making sure you and your agency are conforming to sign standards can help improve safety for both motorists and roadway workers.

*Call today for your copy!*

**United States Pavement Markings**
Pavement markings are another way messages are conveyed to motorists and pedestrians. Pavement markings convey information about conditions ahead, permitted lane usages, and are also used to alert roadway users to potentially hazardous conditions.

Make sure you and your agency are using appropriate pavement markings. *Get your free copy today!*

**Implementing Local Agency Safety Management**
This full-color brochure provides an overview of the importance of integrating drivers, vehicles, and roadways.

Focusing on the goal of a safety management system (SMS), which is to reduce both fatalities and the severity and frequency of collisions, local agency engineers, managers, elected officials, and many more individuals and agencies can all benefit from an SMS.

**West Virginia Loggers Safety Field Guide**
This 132-page laminated pocket guide was developed through a cooperative agreement between the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, and the West Virginia Department of Health and Human Resources, and was contracted to West Virginia University, Department of Emergency Medicine, Center for Rural Emergency Medicine.

This guide covers personal protective equipment, chain saw inspection and operation, tree felling, and much more.

Even if you “grew up with a chain saw,” this guide would be beneficial and may even teach you some new things.

The WV T^2 Center is a part of the nationwide Local Technical Assistance Program (LTAP), which is funded by the Federal Highway Administration. The Center also receives funding from the West Virginia Department of Transportation.

**Mission:**
The mission of the West Virginia T^2 Center is to foster a safe and efficient transportation system. The T^2 Center’s mandate is to improve the transportation system by improving the professional skills of those involved in highway design, construction and maintenance, and to act as a resource for them by keeping up-to-date training libraries and constantly seeking/developing new technologies.

**Overall Goal:**
The Center’s overall goal is to improve the transportation system by focusing on professional training, technical assistance, and information dissemination.

To achieve this goal, the WV T^2 Center does the following:

- Provides on-site training and demonstrations
- Publishes a quarterly newsletter
- Maintains a video and publications library
- Provides technical assistance via e-mail, telephone, fax, mail, or site visits.
### Upcoming Roads Scholar II Courses

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### Upcoming Roads Scholar I Courses

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