

# WORKER SAFETY TRAINING MODULES



**IOWA STATE  
UNIVERSITY**

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# ABOUT THE TRAINING MODULES

The Safety Handout Training Modules are easy-to-use, customizable training materials for conducting worker safety training sessions. Use these self-contained modules in any order to train new employees or review safety topics with more experienced employees.

Each module includes a handout for employees and a guide for the trainer. The employee handout provides employees with an outline of important information on the module topic. The trainer guide includes training activities, training goals, and tips for supervisors.

## ***Simple steps for a successful safety training session***

1. Choose the module most relevant to your work situation.
2. Review the information in both the supervisor guide and the employee handout, paying particular attention to “Training Goals.”
3. Gather materials you will need for the suggested activity (video, props, examples of safety equipment, etc.) or plan an alternate activity.
4. Make copies of the employee handout for each participant attending the safety training session.
5. Conduct the safety training session.

## ***For more information, contact***

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Jim can also recommend additional training materials.

## ***To search the Stan Ring Memorial/LTAP Library at CTRE***

Visit <http://www.ctre.iastate.edu/library/search.cfm>



# HARD HATS

## Training goals

Persuade employees to regularly wear their hard hats. At the end of the training session, employees should be able to

- Explain/understand the benefits of wearing a hard hat.
- Explain their agency's policy on when to wear a hard hat.
- Demonstrate how to properly adjust and wear a hard hat.
- Explain where to store a hard hat.

## Materials needed

- LTAP Library video: *Hard Hats, Hard Heads* (1994, V 351, 4 min.).
- Several good hard hats.
- One hard hat that's in bad shape and one that's been left in the sun a long time.
- Two melons that are large enough to "wear" a hard hat.
- A tarp or sheet of plastic.
- A sledgehammer.
- Objects like bricks, pieces of pipe, and other materials that might fall on a worker (and that can be used to keep the melons from rolling away during the demonstration).

## Training activities

1. Show video and discuss. (6 min.)
2. Pass around a bad hard hat. Ask learners to shout out the defects. If they don't identify all the flaws, point them out. (3 min.)
3. Pass around the hard hat that's been left in the sun too long. Ask learners if they can see anything wrong with it. Explain that ultra violet rays make the hat weaker and that it's best to store hard hats out of direct sunlight. (3 min.)
4. Show the inside of a good hard hat and pass around a few good ones. Explain the importance of the suspension, how it works, and how to adjust it to fit properly. (3 min.)
5. Explain your agency's policy on when to wear a hard hat. Ask several "what if" questions that require learners to think about different work situations and whether a hard hat is required. (4 min.)
6. Ask learners to grab a hard hat and adjust it for their own wear. Check to make sure they're doing this properly. (5 min.)

## HARD HATS

7. Spread out the tarp or plastic sheeting (preferably outdoors to avoid a mess). Place a poor-fitting hard hat on one melon and smack the hard hat with the sledgehammer. Ask for a volunteer to adjust a hard hat to fit another melon. Ask for additional volunteers to drop objects on it and finally to smack it with a hammer. (7 min.)
8. Ask learners to explain the benefits of wearing a hard hat. (2 min.)

### ***Supervisor responsibilities***

Make sure that

- Each employee has a properly maintained hard hat available when needed.
- All hard hats are periodically inspected for cracks and tears.
- Each employee wears his/her hard hat when necessary.

# HARD HATS

Damage to any part of your brain will cause a malfunction somewhere in your body, either temporarily or permanently. A hard hat provides protection for your brain on the job site. In addition to cushioning your head from blows, hard hats can protect you from electric shocks, chemical spills, or hot materials.

## ***How to wear your hard hat***

Proper adjustment is important. The webbing and band should be adjusted so the hard hat is secure on your head and doesn't fall off when you bend over.

Chin straps are available to increase protection. Chin straps will help the hard hat stay on in windy conditions or when working next to high-speed traffic. Think of the limited protection a football player would have without a chin strap on his helmet.

- Do not wear your hard hat on top of any other hats or hoods.
- Never remove the hard hat's suspension.
- Periodically check your hard hat and its suspension for cracks, tears, or frayed material.
- Most hard hats should be replaced every two years.

## ***When to wear your hard hat***

You should always wear your hard hat when working in the following situations:

- In contractors' hard hat zones.
- While operating heavy equipment.
- Where there is danger of head injury from falling or flying objects.
- When there is danger of contact with a high-voltage electric source.
- When your agency or Occupational Safety and Health Administration (OSHA) regulations require hard hats.
- When working on or adjacent to the traveled portion of the roadway (as needed).

## ***Where to store your hard hat***

You can't tell just by looking, but leaving a hard hat in the sun—like the back window of a vehicle—is bad for your hat. The sun's ultraviolet rays can damage the hat and make it weaker. It's best to store your hard hat out of direct sunlight.

# LIFTING & CARRYING

## Training goals

At the end of the training session, employees should be able to

- Demonstrate proper lifting and carrying procedures.
- Use alternative lifting procedures (lifting with a partner or using a crane or dolly).
- Explain/understand the importance of proper lifting and carrying.

## Materials needed

- LTAP Library videos: *Back to Basics* (1996, V 472, 5 min.), *Back Care and Safety* (1989, V 473, 15 min.), *Shoveling Safety* (1990, V 488, 5 min.).
- Several items of various sizes and weights that are frequently lifted and carried in your shop. Include one with jagged or sharp edges; one that's wet, dirty, or greasy; one that requires a handcart, crane, or partner; and one that's easy for one person to lift alone.
- A few small items such as tools, pop cans, rags, etc. that can be distributed around the floor as "debris" that employees should look out for and remove before lifting.
- A handcart or crane.

## Training activities

1. Show one or more videos and discuss. (10–20 min.)
2. Set up a "bad" lifting and carrying scenario by scattering "debris" on the floor. Put a closed, lightweight box in the middle. Demonstrate bad lifting and carrying techniques such as bending over and lifting with your back, not inspecting the box and cutting yourself on a sharp edge, tripping over something in your path, twisting at the waist to set the item down, or throwing/dropping the box. Ask the learners to identify what you did wrong. (4 min.)
3. Spread the other items that need to be lifted and carried around the training area. Ask learners to inspect each item for things to watch out for (sharp corners, slippery texture, heavy load, etc.). Once they've concluded their inspection, ask them to toss out their ideas for each item, one by one. Discuss the potential hazards of each and demonstrate how to inspect each item. (4 min.)
4. Using light items, ask each learner to practice proper lifting and carrying techniques. (5–7 min.)
5. Move to an item that requires a handcart, crane, or partner and demonstrate how to lift with each of these. Allow learners to practice until you're sure everyone can use a handcart or crane and lift with a partner properly. (8–10 min.)

## LIFTING & CARRYING

### ***Supervisor responsibilities***

- Provide a list of physical requirements to prospective employees and physicians who do pre-employment physical examinations.
- Provide proper lifting aids and instruction for how to use them.
- Set aside a warm-up period for employees who routinely perform lifting tasks. Encourage all employees to participate.
- Locate storage areas and loading platforms in convenient locations. Storage racks should be within easy reach of the shortest employee. Frequently handled loads should be stored between knee and waist level. Carrying distances should be minimized.
- Analyze current practices. Determine whether the job can be managed to eliminate manual handling as much as possible. Ordering material in smaller quantities can help improve lifting practices

# LIFTING & CARRYING

Using proper lifting and carrying techniques can prevent common workplace injuries, especially to your back. If you think an object is too heavy to lift without injuring yourself, you can always lift with a partner or use a crane, hoist, dolly, or other lifting or moving equipment.

## ***How to lift***

### Before you lift

- Warm up with stretching exercises.
- Inspect the object for slivers and jagged or sharp edges.
- Wipe off greasy, wet, slippery, or dirty objects.
- Make sure the work area is free of debris to avoid tripping.
- Rock the load to estimate its weight. Don't lift objects that weigh over half your body weight.

### When you lift

- Position your feet correctly. Place your feet about shoulder-width apart, with one foot in the direction of movement and the other in a position where it can give thrust to your body.
- Keep the object as close to your body as possible.
- For a compact object, squat down and straddle the object with your knees. Keeping your back relatively straight, pull the object in toward your torso and use your legs to help lift. Your legs are four times as strong as your back.
- Grasp the object correctly. Keep your fingers away from pinch and shear points. Grasp boxes at opposing top and bottom corners.

## ***How to carry***

- Move as smoothly as possible.
- Never turn at the waist to change direction or to put the object down.
- Set the object down close to your body or place it on the near edge of a shelf or truck bed.
- Never throw or drop large or heavy objects. Use a suitable lowering device if necessary.

## ***Team lifting***

- Make sure the load is level.
- Lift, walk, and set down the load in unison.
- Call out commands of "lift" and "set down."
- When carrying long sections of pipe, place them on shoulders and use shoulder pads.

# SHOP SAFETY

## Training goals

At the end of the training session, employees should be able to

- Understand the importance of shop safety.
- Maintain a clean work environment.
- Use pneumatic tools safely.
- Store and dispose of hazardous materials properly.
- Use safe painting techniques.
- Use proper ventilation.
- Prevent fires and explosions.
- Identify the locations of a first aid station and emergency eye wash station.

## Materials needed

- LTAP Library videos: *Lock Out/Tag Out Procedures* (V 404, 6 min.), *Fire Safety: There's No Second Chance* (1996, V 480, 20 min.), *Power Tool Safety: A Skill You Need on the Job* (V 708, 37 min.), *Hand Tool Safety in the Workplace* (1995, V 713, 30 min.), *Hand and Arm Protection* (V 717, 11 min.).
- Items to “mess up” a clean shop such as hand tools, oily rags, old paint cans, etc.
- Water or pop to create a “spill.”
- A tool (from home or kept for training purposes) that has a frayed cord.
- A simple map of the shop and copies for everyone.

## Training activities

1. A few minutes before training starts, clear employees of an area in the shop so you can “mess it up.” If possible, choose an area of the shop where a fire extinguisher is located and “hide” it. Disarrange properly stacked and stored items, create a spill that needs to be cleaned up, leave tools (including the tool with a frayed cord), rags, etc. out and in unsafe locations. While the training site is being messed up, have an assistant pass out the shop map and ask employees, from memory, to mark all fire extinguishers on the map. (5 min.)
2. Next, have employees in teams or individually walk through the messed up area and make a list of all the safety problems they can identify (they could take a copy of the shop safety worker handout as a guide). After everyone's had a chance to make a list, walk through the messy area with everyone and discuss their answers. Make sure to discuss the location of fire extinguishers, the location of first aid stations, the location of the emergency eye wash station, and the importance of maintaining easy access. (15–20 min.)

## SHOP SAFETY

3. Walk through the whole shop and, as a group, identify the most important safety concerns within each area. (8–10 min.)
4. Watch one or more videos and discuss. (13–40 min.)

### ***Supervisor responsibilities***

#### **Maintain a clean work environment**

- Designate storage space for everything.
- Provide sufficient housekeeping tools, including brooms, clean rags, and spill absorbers.
- Define areas for scrap storage and schedule regular collection, removal, and disposal.
- Assign clean-up responsibilities and make sure work sites are cleaned and cleared before quitting time.

#### **Keep the worksite safe**

- Install non-slip treads on ramps and steps.
- Remove excess vegetation around combustible storage areas.
- Clearly mark aisles and passageways.
- Be sure shop lighting is adequate in all areas.
- Allow a minimum of 18 inches of clearance between storage and sprinklers.
- Secure all storage racks to the floor, wall, and each other.
- Check functioning of ventilation equipment for effective removal of exhaust, paint spray, and other fumes.
- Store full propane cylinders outside or in a non-heated, well-ventilated structure. Keep them secure from tampering. Make sure they're marked according to National Fire Protection Association standards.
- Store oxygen tanks and acetylene tanks for welding and cutting separately. See OSHA regulation 1910.253 for details.
- Check the condition of power tool cords and hoses.
- Monitor noise in the shop.
- Review guidelines for safe equipment operation.
- Review the contents and hazards of the materials your crew may handle and coach them on proper protective procedures. Use Hazardous Material Identification System placards (check with your local fire department).

#### **Maintain safety equipment**

- Check fire extinguishers monthly and maintain a record of inspection.
- Have a qualified company check fire extinguishers yearly.

# SHOP SAFETY

Good housekeeping habits and organization can help prevent injuries from tripping and slips as well as from hazardous materials. Make sure you know how to operate all equipment safely.

## ***Prevent tripping***

- Keep access ways and aisles free from debris.
- Return tools, especially small hand tools, to their storage areas after use.
- Minimize the use of extension cords.

## ***Prevent slips***

- Clean up spills promptly with the appropriate (nonvolatile) solvents.
- Remove grease, oil, ice, snow, and mud from walkways, steps, and ladders.

## ***Stack materials properly***

- Do not allow materials to protrude past the edge of the shelf or bin.
- Use pallets when stacking uneven material.
- Store pipe, ladders, structural steel, etc., horizontally or secure with brackets so they don't fall due to machine vibration or accidental brushing.
- Build a pyramid when stacking pipe. Block the first layer to keep it from rolling away.
- Store tires vertically in racks.
- Remove nails from excess lumber, sort the lumber by size, and store it in a separate area.
- Securely strap gas cylinders to a support.

## ***Prevent fires and explosions***

- Clean up gas and flammable liquid spills immediately.
- Do not wear clothing that has been in contact with flammable liquids.
- Remove all ignition sources from the fuel area.
- Never hang clothes or rags near operating machinery lines, heating vents, or ventilation ducts.
- Guard grinding wheels against explosion by using the properly rated wheel in the grinding device.
- When welding, eliminate fire hazards and adequately ventilate the area.

## SHOP SAFETY

### Store combustible and hazardous material properly

- Store flammable materials in designated areas.
  - Oily rags in covered cans.
  - Paint in a paint locker.
  - Explosives in a protective hut.
  - Fuel oil and kerosene behind a concrete barrier.
- Store gas cans properly.
  - Use gasoline transport containers approved under the National Environmental Policy Act (NEPA).
  - Ground gas cans to prevent sparking.
  - Refill empty cans with gasoline to prevent fume buildup.
- Store full propane cylinders outside or in an unheated, well-ventilated structure. Secure them from unauthorized access and tampering.
- Keep sources of ignition away from combustibles, including the following:
  - Lit cigarettes.
  - Welding heaters.
  - Running vehicles.

### ***Extinguish fires safely***

Know how to operate each class of fire extinguisher and where fire extinguishers are located in the shop.

### ***Paint and painting***

- Avoid prolonged exposure to paint fumes. Wear a properly designed ventilator to avoid inhaling paint and solvent fumes.
- When sanding or grinding paint, wear a ventilator or mask.
- Do not heat paint inside an enclosed structure unless the ventilation equipment meets the National Fire Protection Code.
- When spraying paint, be sure to do the following:
  - Use designated paint booths.
  - Keep out of the direct spray area. Paint sprayed at a pressure of only 30lbs/in<sup>2</sup> can become embedded in your skin.
  - Do not use high-pressure air to blow dust from your clothing. Dust, like paint, can become embedded in your skin.

## SHOP SAFETY

- Always use factory made and tested high pressure hose couplings, and do not exceed their pressure ratings.
- Dispose of old paint and paint containers properly.

### ***Ventilate properly***

- Adequately ventilate solvent, gasoline, and other chemical vapors and exhaust fumes.
- Know and employ proper maintenance methods to reduce contact with asbestos and asbestos dust.

### ***Use pneumatic tools safely***

- Wear hearing protection while working with pneumatic tools that operate in a range above 85 decibels.
- Pay attention to where debris is thrown when using any pneumatic tool.
- Minimize the possibility of electrocution:
  - Don't stand in liquids.
  - Don't use a tool with a frayed cord, exposed conductors, or a broken grounding plug.

### Using an air hammer

- Before operating, be sure to do the following:
  - Put on safety shoes and eye protection.
  - Know the location of the “deadman” switch and check to see that it works.
  - Properly secure hose connections and use retainer clips.
- While operating, adhere to the following guidelines:
  - If possible, use wet drilling rather than dry drilling to reduce the amount of flying debris and dust.
  - Take frequent breaks to reduce the cumulative effects of vibration and noise.
  - Do not guide the air hammer with your feet.
- When finished operating, vent the compressor air tank before removing the hoses or disconnecting the air hammer.

### Using cutting tools

- Check bolts for adequate tightness and check chuck bushing for excessive wear.
- Do not allow the heads of cutting tools to mushroom. Deformed heads should be ground to their original shape to prevent splinters from chipping off the tool.
- In cold weather, warm the cutting tool before use to prevent spalling.

# WORKSITE SAFETY

## Training goals

At the end of the training session, employees should be able to

- Follow an internal traffic control plan.
- Back a vehicle safely.
- Stay safe as a worker on foot around moving vehicles in the worksite

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## Materials needed

- LTAP Library videos: *Highway Work Zone Safety: One Step From Death* (1997, V 506, 11 min.), *Highway Work Zone Safety: Plant Site Safety* (1997, V 508, 10 min.), *Highway Work Zone Safety: Traffic Control Safety* (1997, V 510, 10 min.), *Sorry, I Didn't Hear That* (1994, V 350, 6 min.), *Road Crew Safety* (1998, V 577, 29 min.).
- Sample plan/map of a work site, including the heavy equipment used, and copies for everyone.
- Work truck.
- Traffic cones.

## Training activities

1. Show one or more videos and discuss. (13–35 min.)
2. Distribute a sample plan/map of a work site. Ask employees to work in teams and draw up an internal traffic control plan. Each plan should have the following basic elements:
  - Parking areas for workers and visitors.
  - Areas around heavy equipment and operations where workers on foot are not allowed (for equipment turnarounds and swing radius areas).
  - Locations for equipment and materials storage and servicing.
  - Any internal traffic control devices or signs.
  - Speed limits.

Discuss any differences in the teams' plans and why they chose to organize their plans as they did. (15–20 min.)
3. Review the safety equipment on a truck, paying special attention to backup alarms. (8–12 min.)
4. Set up cones in the yard and have everyone practice backing with the box up and down. Use spotters to help every driver check blind spots. (20–30 min.)

## WORKSITE SAFETY

### ***Supervisor responsibilities***

- Develop, implement, and enforce a traffic control plan specific to each construction site to reduce backing of construction vehicles.
- Ensure that backing procedures are in place and that designated individuals are assigned as spotters to direct backing vehicles in construction sites.
- Ensure that heavy equipment operators always remain aware of the location of workers around their machines.
- Ensure that communication exists among equipment operators and workers on foot.
- Ensure that operators do not permit riders on industrial equipment or vehicles that are not designed for passengers.
- Immediately repair equipment when problems, such as broken backup alarms, arise.
- Ensure that workers who are not fit for duty due to illness or fatigue are not assigned to hazardous tasks.
- Provide appropriate safety equipment:
  - Safety glasses or face shields.
  - Hard hats.
  - Ear plugs or muffs.
  - Highly visible safety apparel.
  - Warning lights for work vehicles.
  - Rubber gloves and aprons.
  - Dust masks or ventilators.
  - Cones and barricades.
  - Proper warning signs.

# WORKSITE SAFETY

Every year on worksites workers are injured and equipment is damaged when vehicles are backing up. Workers are struck mainly because many construction vehicles have large blind spots and workers on foot can't always hear back-up alarms on a noisy construction site.

## ***Internal traffic control plan (ITCP)***

An ITCP is a tool project managers can use to coordinate the flow of construction vehicles, equipment, and workers operating in work zones to prevent vehicular accidents and fatalities. Establishing safe construction traffic control principles is the foundation for setting up and maintaining an effective ITCP. These principles include the following:

- Reducing the need to back up.
- Limiting access points to work zones.
- Establishing work zone layout according to equipment types.
- Providing signs within the work zone that give guidance to pedestrians and vehicle operators.
- Designating buffer spaces to protect pedestrian workers from errant vehicles and work zone equipment.

## ***Prevent injuries while operating machinery***

- Come to work ready and able to work. If you are ill or have taken medications that could interfere with your ability to safely operate machinery, notify your supervisor.
- Ensure that all vehicle safety equipment works properly before operating a vehicle.

## ***Drivers***

- Follow established backing procedures.
- Maintain communication with workers on foot.
- Do not permit riders on vehicles that are not designed for passengers.
- Use a spotter if needed.

## ***Workers on foot***

- Be aware of the location and movement of vehicles around you.
- Stay out of the way of moving vehicles.
- Never assume a vehicle operator has seen you.
- Don't walk in back of or between two vehicles.

# SAFE VEHICLE OPERATION

## Training goals

At the end of the training session, employees should be able to

- Check a vehicle's safety equipment.
- Operate a vehicle safely.

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## Materials needed

- LTAP Library videos: *Pulling Trailers* (1999, V 612, 5 min.), *On Again, Off Again: A Guide to Mounting and Dismounting Heavy Equipment* (V 726, 18 min.).
- One or two work trucks. If feasible, have one or two safety defects per vehicle.
- Checklist of safety inspection items and copies for everyone:
  - Brake lights.
  - Emergency lights.
  - Headlights.
  - Window washer fluid.
  - Current first aid kit.
  - Operator controls.
  - Fire extinguisher.

## Training activities

1. Park the trucks in the yard. Have employees work in pairs or teams to go through safety inspections. (10–15 min.)
2. Review the proper procedures if/when employees find safety defects. Discuss what needs to be done before they can take the vehicle out of the yard. (7–10 min.)
3. Discuss your agency's policies on pre-trip inspections. Is it feasible to do a safety inspection every day? (5–6 min.)
4. If you have a new vehicle, a dealer representative may be available to come to your shop and share safety training specific to your vehicle. Contact your vehicle dealer to arrange this type of instruction.
5. Watch one or more videos and discuss. (8–20 min.)

## SAFE VEHICLE OPERATION

### ***Supervisor responsibilities***

#### **Make safety a priority**

- Provide laminated copies of a written pre-trip inspection routine to each employee.
- Watch carefully for alcohol or drug abuse. Supervisors who knowingly permit an employee to work under the influence of alcohol or drugs may be subject to disciplinary action and possibly personal liability.
- Make sure all vehicles are equipped with proper fire extinguishers.

#### **Check vehicle maintenance area safety**

- Inspect the condition of mechanics' hand tools.
- Check the functioning of ventilation equipment for effective removal of exhaust, paint spray, welding solvent fumes, and break and clutch lining asbestos dust.
- Check the condition of power tool cords and hoses.
- Ensure the safe storage of tires, lubricants, paint, and parts.

#### **Maintain records**

- Check equipment operators' and mechanics' reports for prompt repair of defective safety equipment, including lights, wipers, horns, mirrors, etc.
- Ensure that maintenance records are completed promptly and dated correctly.

#### **Routinely check your employees' drivers licenses and CDLs to make sure they are current**

- Do not allow any employee to drive with an inappropriate or expired license.
- Make note of employees whose licenses will expire prior to the next scheduled check.

# SAFE VEHICLE OPERATION

Operating motor vehicles safely requires attention and skill. Make sure you learn how to operate any vehicle you're asked to drive and familiarize yourself with it before going anywhere. A driver who doesn't know where the headlight switch is, for example, can become distracted while looking for it. This presents a safety hazard.

## ***Before driving***

- Come to work only if you are healthy and ready to work. Sick operators may be relieved from duty. Report to supervisors any medications you have taken that may affect your ability to drive.
- Maintain your driver's license and commercial driver's license (CDL).
- Establish and follow a written pre-trip inspection routine before taking any vehicle out of the yard. That routine may include checking the following:
  - Major controlling functions, including steering, brakes, hydraulics, cables, heating, and exhaust units.
  - Safety equipment, including lights, flashers, alarms, fire extinguishers, and first aid kits.
  - Exhaust system, including checking for leaks.
  - Cleanliness of mirrors, windows, cab floor, etc.

## ***When driving***

- Drive defensively and yield the right of way.
- Wear a seatbelt.
- Ventilate the cab. In dusty conditions, use the air conditioning.
- Back the vehicle with the help of mirrors, horn and warning signals, and spotters, when needed.

## ***When exiting the vehicle***

- Turn the engine off.
- Avoid dismounting into traffic.
- Use steps and handholds.

# SNOW AND ICE OPERATIONS

## Training goals

At the end of the training session, employees should be able to

- Spot dangers specific to snow and ice operations.
- Prepare for snow.
- Safely maintain a plow.
- Stay safe when working outdoors.
- Properly operate snow removal equipment.

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## Materials needed

- LTAP library videos: *Snowplow Safety* (1995, V 463, 23 min.), *Winter Operations Training Program* (series of six on pre-season preparation, equipment operation, plowing techniques, etc., V 563–568 or DVD 11, 11–35 min.), *Safety in Snow Removal* (1998, V 643, 25 min.), *Snow and Ice Control* (2002, V 706, 60 min.), *The Big Chill* (1998, V 576, 5 min.), *Winter Safety* (1999, V 642 14 min.).
- Samples of chemicals used in snow and ice removal.
- Work truck.
- Blade and wing (if used).
- A pre-trip safety inspection checklist and copies for everyone.

## Training activities

1. Show one or more videos and discuss. (18–65 min.)
2. Display samples of chemicals. Describe their uses and their hazards. Demonstrate how to handle them safely. (8–10 min.)
3. Ask volunteers to demonstrate the proper procedures for preparing a truck for snow removal and/or anti-icing/deicing operations. (15–20 min.)

Procedures should include ways to

- Mount the blade and wing.
- Conduct a pre-trip safety inspection.
- Operate the blade and wing.
- Load and distribute chemicals.

# SNOW AND ICE OPERATIONS

## ***Supervisor responsibilities***

### **Organize plowing operations**

- Assign each truck to a specific area. If a problem arises, you will know where to locate each vehicle.
- Keep track of your crew. Equip each truck with a two-way communication device or establish checkpoints. Note trucks loading at the sand/salt storage areas. A disabled truck may be identified when it doesn't show up as expected.

### **Exercise care when handling snow and ice control chemicals**

- The manufacturer's material safety data sheet (MSDS) should be posted wherever chemicals are stored and handled.
- Place salt on an impermeable pad to avoid contamination.

### **Treat your crew well**

- Watch for fatigue in your crew. Communicate the duration of a shift to crew members in advance.
- Treat private contractors the same way as your regular crew. Require the same training and the same safety procedures as for your regular crew.
- Check with your drivers to determine whether they have noticed any vision problems. If they have, a rest period may be in order. Falling snow, blowing snow, extended night driving, sun glare, and whiteouts lead to eye fatigue, which can reduce vision acuity and depth perception and increase the possibility of an accident. If doubt arises about a driver's vision, check with a physician. Certain eye defects may disqualify a driver from plowing operations, even though the driver is qualified for normal work operations.

### **Provide appropriate safety equipment**

- Shovel.
- Ice scraper.
- Flashing warning lights.
- Flashlight.
- Up-to-date first aid kit.
- Two-way radio, cell phone, or other communication device.

# SNOW AND ICE OPERATIONS

Snow and ice increase the risks of slips and falls due to slippery conditions and frostbite due to exposure.

## ***Before ice and snow arrive***

- Attend training on the safe handling of chemicals used in snow and ice control operations.
- Become familiar with equipment operation.
- Take a practice run of your assigned plowing route and make a record of your concerns about the route.
- Note the following obstacles:
  - Low hanging cables.
  - Deep side ditches.
  - Steep shoulders.
  - Raised manhole covers.
  - Offset curb and pavement joints.
  - Railroad crossings.
  - Yield and merge intersections.
  - Blind and left-turn intersections.
  - Sign posts.
  - Fire hydrants.
  - Guardrails.
  - Fences.
  - Congested areas.
  - Mail boxes.
  - Narrow roadways.
  - Areas requiring special maneuvering, such as cul-de-sacs, steep grades, or dead ends.

## SNOW AND ICE OPERATIONS

### ***Cold weather safety***

- Dress in layers so you can be comfortable as temperatures fluctuate.
- Be cautious of frostbite. Symptoms include severe pain followed by a feeling of warmth in the affected area. Do not be fooled by the apparent return of warmth. Return to the shop and seek aid immediately.
- Stay with your truck if it is immobilized, but be careful to avoid carbon monoxide buildup. Keep fresh air circulating, run the motor sparingly, and open the downwind window.

### ***Plow maintenance***

- Keep plow blades and hoppers in working order. Having to perform outdoor maintenance or repair work during cold weather on your equipment can increase the risk of frostbite.
- Check the cab for exhaust seepage. Remember that carbon monoxide is colorless, odorless, and tasteless. If you feel excessively drowsy, check the cab for intrusion of exhaust gases.
- Make sure warning lights are working properly.
- Keep all lights clean.

### ***Plowing safety***

- Watch for pedestrians and other vehicles.
- Plow at an appropriate speed.
- Avoid situations that require backing up. If backing up is unavoidable, use a spotter, if possible.
- Operate wings carefully.
- When plowing snow, stop often to check and clean the lights. This also gives you a chance to stretch and rest your eyes.
- Open the window or side window vent slightly to help keep you awake and to keep the windshield a little cooler.