Safety Manual

Revised March 2025

FOREWORD

Employee safety is a top priority with the Commission, Management and the Health and Safety Section. Through cooperation, teamwork, and everyone striving for a common goal, we can accomplish the mission of the Department in a safe working environment.

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1

GENERAL INFORMATION AND POLICIES

AUTHORITY

The Health and Safety Section (originally called the Safety Office) was created by Administrative Order No. 60-8 as an administrative staff unit of the Arkansas Department of Transportation. It is currently headed by the Section Head of Health and Safety.

GENERAL STATEMENT

It is impractical to include in this manual instructions which cover every detail under all conditions in connection with the work performed by the various classes of employees. These rules are intended to outline the fundamental principles which should be observed in carrying out the Department's work in a safe manner. It must be remembered that the direct supervisor is responsible for making "good judgment" decisions in the application of the information contained in this manual.

Hereafter, when the words "state", "Department", "Director" and "employees" are used in this manual, they shall refer to the State of Arkansas, the Arkansas Department of Transportation, the Director of Highways and Transportation, and the employees of the Arkansas Department of Transportation, respectively.

SCOPE AND POLICY OF HEALTH AND SAFETY SECTION

The Health and Safety Section's main objective is to prevent job and vehicular accidents through ongoing training and accident reviews, thereby preventing personal injuries, property damage, equipment damage, and reducing the number of work hours lost due to disability.

In attempting to attain this objective, the Health and Safety Section is charged with carrying out statutory provisions as well as policies, rules and regulations promulgated by the Director and the Arkansas Highway Commission.

RESPONSIBILITIES OF HEALTH AND SAFETY SECTION

1. Educate through meetings, conferences, demonstrations, classes and "tailgate" meetings when warranted.

2. Promote safety rules, regulations, guidelines and manuals covering the various types of operations performed by Department personnel as well as highway contractors.
3. Promote and use the most modern and effective types of safety equipment and devices.
4. Inspect, review, educate and consult all operations, plants and equipment as such may pertain to safety and consult with personnel from all Divisions, Districts and Sections in safety matters.
5. Promote work which will encourage the use of safe practices by all employees in carrying out assigned tasks.
6. Discuss and constructively criticize any matters which pertain to safety.
7. Research employee accident records.

RESPONSIBILITIES OF DIVISION HEAD/DISTRICT ENGINEER

1. Oversee the overall accident prevention program in the Division/District.
2. Take measures as deemed necessary to conform to the intent of this manual.
3. Immediately correct observed safety violations.
4. Review and approve actions recommended by the District Safety Accident Review Committee.
5. Attend District Safety Accident Review Committee meetings.

RESPONSIBILITIES OF SUPERVISORY PERSONNEL

1. Assume and carry out safety duties as designated by the Division Head/District Engineer.
2. Correct any safety violations immediately and report same to the Division Head/District Engineer.
3. Ensure that each Accident Report is fully and accurately completed prior to presentation to the Division Head/District Engineer.
4. Maintain records to be used for safety meetings.
5. Train employees on equipment before they use it.
6. Determine who will operate the equipment among personnel.

RESPONSIBILITIES OF DISTRICT SAFETY OFFICER

1. Direct the overall accident prevention program in the District.
2. Review all Accident Reports and refer those that warrant additional review to the District Safety Accident Review Committee.
3. Ensure that safety meetings are held as warranted for all personnel in the District.
4. Immediately correct observed safety violations.
5. Establish a District Accident Review Committee. This committee is responsible for safety related issues within their area. This committee should consist of the following: at a minimum, one District office member, one District-wide crew member, one area crew member, and one member from a Resident Engineer's office.

RESPONSIBILITIES OF HEALTH AND SAFETY OFFICERS

1. Inspect all buildings, grounds and equipment for safety-related items and report findings.
2. Review all types of accidents occurring in the Department.
3. Review field activities and correct safety deficiencies when warranted.
4. Conduct scheduled safety meetings and topic specific safety meetings when warranted.

5. Attend District supervisor meetings when safety issues are to be discussed.
6. Promote safe practices for all employees in carrying out their assigned tasks.
7. Enforce safety rules and regulations covering the various types of operations being performed by all employees.
8. Report any safety discrepancies noted on contract projects to the job inspector, District Engineer, Resident Engineer, or State Construction Engineer.
9. Hold "tailgate" safety meetings when warranted.
10. Assist in the Department's drug and alcohol testing program.
11. Assist in the safety training of new employees in conjunction with the employees' supervisors.

STRUCTURE AND RESPONSIBILITIES OF THE DISTRICT/DIVISION ACCIDENT REVIEW COMMITTEE

1. This committee will include the following mandatory members:
    a. District Construction Engineer, Chairman
    b. District Maintenance Engineer
    c. Equipment Maintenance Supervisor
    d. Assistant Maintenance Superintendent (optional)
    e. Health and Safety Officer
2. The committee may include up to two of the following:
    a. Resident Engineer
    b. Area Maintenance Supervisor
    c. Job Superintendent
3. Committee responsibilities include:
    a. Review accidents referred to the committee by the District Administration or Health and Safety Officer.
    b. Recommend actions to be taken to prevent future accidents of a similar nature.
    c. Recommend disciplinary measures as necessary to ensure that the intent of the safety program is achieved.
    d. Keep an accurate record of the meetings and forward to the District Engineer and the Health and Safety Section.
    e. Meet at least twice a year for review purposes.

STRUCTURE AND RESPONSIBILITIES OF THE DISTRICT/DIVISION SAFETY TEAM

1. This committee should consist of the following members:
    a. (5) Representatives of the individual Divisions.
2. District safety teams should consists of:
    a. District Headquarters Administrative Representative (Chairperson)
    b. Area Maintenance Representative
    c. Representative from the construction side of District
    d. District Crew Member
    e. Health and Safety Officer
3. Team Responsibilities include:
    a. Promote safe working environments
    b. Review safety concerns and requests
    c. To help prevent accidents
    d. Recommend best safety practices
    e. Meet at least three times a year to review safety practices

Chapter

2

GENERAL SAFETY RULES

Every employee is asked to familiarize themselves with the rules and avoid any violations. Remember that a willful violation of any rule invites disciplinary action, including possible discharge.

ATTITUDE - COOPERATION
The Department's accident prevention program is for your protection. A positive attitude combined with dedicated effort and complete cooperation ensures the basis for your safety.

CARELESSNESS
Any careless or thoughtless act or omission not covered generally and specifically by these regulations shall be construed as failure to abide by safe practices and shall be subject to review.

CELL PHONE USAGE
While performing certain safety-sensitive duties (flagging, mowing, operating equipment, driving trucks requiring a CDL, etc.) the usage of cell phones, portable/personal music devices, and reading materials are prohibited. Texting while driving is prohibited by law (27-51-1501 -"Paul's Law"). This does **not** pertain to usage of state radios for communications.

CLOTHING
Because of heat-related concerns, protection to the body, and appearance to the general public, it is important that all employees be **fully** clothed. This includes hats, shirts and pants for field personnel. For safety reasons, no dresses, skirts, skorts, shorts or Capri pants may be worn by field personnel. Also, field personnel may not wear tank tops or sleeveless shirts. Shoes should be conducive to and appropriate for the employees' work environment and anticipated duties. Obviously, there is a variance in clothing and footwear worn by office workers versus that worn by field employees.

EMERGENCY SHOWER AND EYE WASH
Each emergency shower and eye wash station must be kept clean and free from clutter, and should be checked for proper working order once a month. Documentation should be kept when checked.

EYE PROTECTION (SAFETY GLASSES, GOGGLES AND/OR FACE SHIELD)
Eye protection, which can be obtained from the Department, shall be worn by employees where flying particles, corrosive vapors and liquids are likely to be hazardous to the facial portion of the body. Non-safety compliant sunglasses are not approved eye protection.

FALL PROTECTION
An appropriate form of fall protection should be used when working in areas six feet above the ground and higher.

FIRE EXTINGUISHERS
Fire extinguishers are available to all work crews where appropriate. Employees are to inspect and ensure the fire extinguishers are in working condition and charged. Fire extinguishers housed in buildings should be placed on a red background.

FIRST AID KITS
First aid kits are available to all work crews. Supervisors and employees are required to inventory and replace used or outdated items.

HATS
Field employees shall either wear NO headwear or headwear that displays the Department emblem/logo for identification purposes.

Ball cap: A ball cap with the Department emblem will be issued to each field employee. This cap may be replaced when necessary; however, if lost it will be the responsibility of the employee to purchase a new one.

Hardhat: This hat is yellow or white in color and displays a Department emblem. It is issued at no cost to the employee. Hardhats are available to all employees who wish to take advantage of this safety headgear. Employees shall wear the hardhat when working in areas where there is a danger of head injury from impact from falling or flying objects, or from electrical shock and burns. Hardhat wear is mandatory for all employees when assigned to structural or bridge work and to any area where overhead or underground work poses a threat. An employee may choose to wear the hardhat at all times. The Division Head or District Engineer is responsible for determining if hardhats are required in any questionable area of operation.

Wide-brimmed hat: Certain wide-brimmed hats (brims may be as wide as five inches) are permissible, provided that a hatband with a Department emblem is used. The Department hatband will be supplied at no cost to the employee; however, the employee is responsible for the purchase of the hat.

Bucket style hat: Department issued headgear is provided to employees to protect against sun exposure.

Beanies/Toboggans: Department issued headgear is provided to employees for use during cold weather.

Hats are not required when working indoors or when operating a closed motor vehicle. When an employee leaves the Department, the supervisor should collect all headgear issued. All headgear should be kept clean and neat.

HEARING PROTECTION
Hearing protection is provided by the Department and should be used when needed or when the sound level is above the permissible exposure level.

HORSEPLAY
Any action of horseplay will not be tolerated by the Department and will be cause for disciplinary action up to and including termination. Practical jokes and the misuse of Department equipment are prohibited, even for the purpose of intended humor.

INTOXICANTS AND ILLICIT DRUGS
Reporting to work while under the influence or in possession of an intoxicant or illicit drug, or the use of any type of intoxicant or illicit drug during working hours, is forbidden and will subject the offender to dismissal.

SAFETY VESTS/SHIRTS
Department issued safety vests shall be worn by all flaggers and employees engaged in operations upon or adjacent to a highway or roadway **at all times**. Safety vests must be kept clean and neat to be effective.

New Employees:
All new employees working in Construction and Maintenance areas will be issued a **Green Safety Vest** to wear for a minimum of six month during their initial safety training period. Employees wearing green vests **SHALL** not be allowed to work on the roadway unless accompanied by an experienced employee.

SAW CHAPS
The Department will provide one pair of saw chaps per chainsaw.

SEAT BELTS
Seat belt usage is a state law and a Department policy. Failure to comply with this policy can result in disciplinary action. Employees are to ensure that seat belts are in operable condition.

SMOKING / TOBACCO
Per Department policy, smoking of tobacco or products containing tobacco in any form shall be prohibited in all Department buildings, facilities, and vehicles. Smoking shall be permitted on Department grounds outside building enclosures, provided the smoker is at least 25 feet from any entrance to any building or enclosure.

GENERAL DIRECTIONS FOR FIRST AID

Bleeding
Control bleeding by applying direct pressure over the wound with sterile dressing. Always use personal protective equipment. Seek medical assistance if necessary.

Burns
Cover with clean dry dressing. Elevate burned area above the heart level if possible. Seek medical assistance if necessary.

Eyes
Penetrating object in eye:

1. Protect eye with padding around the object.
2. Place a paper cup or cone over object to prevent it from being disturbed.
3. Cover undamaged eye with a patch.
4. Seek medical attention.

Chemical in eye:

1. Flush eye with warm water immediately.
2. Roll eye as much as possible during flushing.
3. If only one eye is affected, rinse contaminated eye downward away from the other eye.

Fainting
Position the victim on their back. Elevate their feet eight to ten inches. Seek medical assistance if necessary.

Fractures
Immobilize fractured area. Position the victim on their back with head elevated. Cool body. Seek medical assistance.

Frost Bite
Do not attempt to warm body part by rubbing or using warm water. Seek immediate medical attention.

Heart Attack
Administer CPR and use AED if trained and one is available. Seek immediate medical assistance.

Heat Exhaustion
Symptoms may include heavy sweating and a rapid pulse, a result of the body overheating**. Move to cool place. Elevate legs. Apply cool packs. Give water. Monitor.** Seek medical assistance if necessary.

Heat Stroke
Symptoms include rapid heartbeat, rapid and shallow breathing, elevated or lowered blood pressure, cessation of sweating, irritability, confusion or unconsciousness, feeling dizzy or lightheaded, headache, nausea and fainting. Move to cool place. Immediately cool victim by fanning and/or applying cool water. Seek immediate medical assistance.

Hypothermia

Cover body with warm blanket. Wrap additional blanket around the top of the victim's head making sure not to cover their face. Seek immediate medical attention.

Poisoning

Call the Poison Control Center, open 24 hours a day, seven days a week.
Arkansas Poison Hotline 1-800-222-1222

Poison Ivy and/or Poison Oak

Wash affected area with soap and water. Seek medical assistance if necessary.

Shock

Keep the victim lying down. Maintain normal body temperature. Do not give liquids unless the victim is fully conscious. Seek medical assistance.

Snake and Animal Bites

Keep affected area below the heart level. Seek immediate medical assistance.

Stoppage of Breathing

Restart breathing with CPR and use AED if trained and one is available. Seek immediate medical assistance.

Chapter

3

ACCIDENTS - WHAT TO DO?

GENERAL INFORMATION

Department vehicles are not insured. Extended liability coverage for operation of Department vehicles can be obtained from several insurance companies as an addition to the employee's regular automobile insurance. It is not mandatory that employees have this coverage but employees should be aware that, although they are immune from liability in most circumstances, they could be sued related to an accident involving a Department vehicle if it is not being used for official Department business.

Should an employee arrive at or be involved in an accident with someone not employed by the Department, the employee should take the following actions:

1. If not injured, give emergency assistance where needed.
2. If a law enforcement officer is present, follow directions with regard to controlling traffic. If there is not an officer present and the roadway is obstructed, post flaggers or other means of traffic control to prevent additional accidents.
3. If needed, call an ambulance and/or a wrecker.
4. Notify supervisor.
5. Be courteous and render all reasonable aid to law enforcement officers and other authorized persons.
6. If directly involved, obtain all possible information concerning the accident such as:
    a. statements, name and address of owner and operator of the vehicle,
    b. operator's license number,
    c. statements, names and addresses of passengers and witnesses, and
    d. names and badge numbers of police officers investigating the accident.

Employees are not to make statements, either verbal or written, regarding an accident in which Department property or employees are involved. Employees are not to sign statements or give information unless so instructed by the Division Head, District Engineer or as required by the investigating law enforcement agency.

The "Move It" Law (Ark. Code Ann. § 27-53-102, or Act 88 of 1987) applies to Department vehicles. This law states that vehicles involved in an accident shall be moved from the roadway, except disabled vehicles or in situations where there is a visible or apparent injury to a person.

The “Click It or Ticket” Law (Act 308 of 2009) applies to all vehicles. This law is to improve the safety of motorists on highways and roads in the State of Arkansas by making the mandatory seat belt law a primary law for enforcement purposes.

All accidents involving a Department vehicle shall be investigated by a police officer, at the scene if possible, regardless of the situation. If the other party involved will not wait at the scene for an officer to arrive, an Incident Report should be completed. State law requires an accident report be filed with the appropriate law enforcement agency for all accidents resulting in $500.00 or more in damage, unless otherwise requested.

If an employee is involved in an accident while performing a safety-sensitive function, he or she shall adhere to the provisions of the Department’s Drug and Alcohol Testing Policy. Supervisors are to be contacted as soon as possible in the case of any accident.

Chapter

4

PASSENGER CARS AND TRUCKS

The Division Head or District Engineer may prohibit any employee from operating Department-owned equipment when such restriction is in the best interest of the employee, the Department, or the general public. The Division Head of Equipment and Procurement may recommend that an employee be restricted from operating any equipment. Immediate supervisors shall have the authority to determine who will operate a Department vehicle among their personnel.

DRIVER RESPONSIBILITY

An operator of a Department vehicle is considered by the public to be a representative of the Department and is expected to abide by laws as an example for others. Operating a Department vehicle does not grant the operator immunity from the law. In case of an accident or violation of the law, the operator shall be held to the same degree of responsibility as if operating a privately-owned vehicle. The operator may also be subject to disciplinary action by the Department.

Vehicle defects or unusual conditions should be immediately reported to the supervisor. The driver is responsible for the safe operation of the vehicle. The operator is responsible for checking all items identified in the Department's Equipment Preventive Maintenance Program prior to operation.

DRIVER'S LICENSES

In accordance with Department policy and state law, all employees operating state vehicles and road equipment must have a **valid driver's license**, with the appropriate endorsements, as outlined in the Classification Specifications

DEFENSIVE DRIVING

Defensive driving involves anticipating what the other driver might do and being aware of hazards that are likely to develop. As an operator, you must drive for others as well as yourself. It is not enough to observe all traffic regulations. Safe drivers also practice the principle of defensive driving - driving so that they can defend themselves against the situations that cause accidents. The defensive driver expects and makes allowances for reckless or careless actions of others. This driver keeps on the alert constantly and thinks far enough ahead to be able to take the necessary preventive action before dangerous situations produce accidents. Driving is adjusted to meet all hazards of weather, road, traffic and other existing conditions.

SPEED
When driving Department vehicles, the driver should govern speed with the normal traffic flow and conditions, provided this can be done in a safe manner and not exceed posted speed limits. Vehicle speed should be slower when fully loaded or towing other equipment. In this case, the operator should remain alert and pull over as a matter of courtesy and safety to permit accumulated traffic to pass.

Any employee convicted of speeding, reckless driving, unsafe driving or driving too fast for conditions when operating a Department vehicle may be subject to disciplinary action.

DISTANCE REQUIREMENTS FROM OTHER VEHICLES
The operator should keep in mind the distance required to stop the vehicle at various speeds and maintain the proper following distance from other vehicles. As speed is increased, following distance must also be increased. A greater than normal following distance should be maintained on loose-surfaced or wet roads. Sudden stops should be avoided whenever possible. The distance required to bring a car to a complete stop when traveling at various speeds is listed in the following chart. The chart shows the total minimum stopping distance required with perfect four-wheel brakes, on the best type of road surface, and under the most favorable conditions.

SPEED	REACTION DISTANCE	BRAKING DISTANCE	TOTAL STOPPING DISTANCE
40 mph	45’	70’	115’
50 mph	56’	109’	165’
60 mph	66’	156’	222’
70 mph	79’	240’	319’

CONVOY DRIVING
When working in convoy operations, Department vehicles should maintain sufficient distance between trucks to permit other motorists to pass one vehicle without having to pass the entire convoy at one time.

PASSING
An operator must ensure that there is ample clearance when passing other vehicles.

TURNING AND CHANGING LANES
When turning or changing lanes, the operator should use the proper directional lights or hand signals and there must be ample time and distance from other vehicles to safely execute the move.

BACKING
The operator should avoid backing equipment whenever possible. When parking at a curb, allow sufficient clearance to pull out without backing, if possible. Avoid turning into any place where it is necessary to back into traffic. Do not back into intersections, over pedestrian crosswalks, or around corners; it is safer to drive around the block.

Before backing a vehicle, the driver or passenger should walk around the vehicle to determine that there is sufficient area to complete the backing maneuver. The driver should back the vehicle slowly and cautiously, looking to the rear while backing. The fact that the space was clear when the vehicle started backing is no reason to assume that it will remain clear while backing. A car may pull up or an employee or pedestrian may walk behind the vehicle. For this reason, it is necessary not only to determine clearance before getting in the vehicle but also to continue with caution while backing.

If possible, a fellow employee should give guidance while backing. The employee giving directions should stand in a position in full view of the driver, in full view of all vehicles and pedestrian traffic, and in full view of the ground upon which the vehicle is about to back. If these conditions cannot be met, additional signal persons should be used. Remember: the driver is still lawfully responsible in case of an accident while backing.

PARKING

Good judgment and common sense should also be used when parking Department vehicles. The vehicle's emergency brake should be set at all times when parked. Check for other vehicles in operation in the vicinity before parking. The possibility of fire should be considered when parking in dry grass. When on or adjacent to roadways, warning lights should be activated.

A Department vehicle kept overnight at an employee's home should be parked on the private property of that employee if possible.

Care should be taken to park well out of the way when parking at motels or other public places. This will help eliminate hit and run accidents to unattended vehicles. Vehicles should be parked where vandalism is less likely. It is the driver's responsibility to ensure the vehicle is safely and securely parked when left unattended. For security reasons, all employees should lock and remove keys from assigned vehicles, as well as personal vehicles.

RAIN, SNOW, OR ICE OPERATION

Wet, snow-packed or ice-glazed roads present special driving problems which require specific precautions:

1. Maintain a safe interval between vehicles. Stopping distances will increase as much as eight or ten times over those required in ideal conditions.
2. Reduce speed to correspond with conditions; even snow tires or chains will not allow driving at normal speeds.
3. Keep all glass clear. Maintain windshield wipers and defroster in working order. When driving conditions warrant the use of windshield wipers, state law (27-36-204) (2A) requires the operation of headlights during inclement weather.
4. Watch for danger spots. Some spots (runoff and drainage areas) may still be wet, and shady spots and bridges may still be icy, even when other parts of the roadway are clear.

TOWING

The "Arkansas Motor Vehicle and Traffic Laws and State Highway Commission Regulations" state:

1. When one vehicle is towing another, the drawbar or other connection shall be of sufficient strength to pull all weight towed. The drawbar or other connection shall not exceed 15 feet

from one vehicle to the other, except the connection between any two vehicles transporting poles, pipe, machinery or other objects of structural nature which cannot readily be diminished.

2. When one vehicle is towing another, there shall be an additional connection between the vehicles sufficient to hold the vehicle being towed in the event the drawbar or other regular connection should break or become disconnected.
3. When one vehicle is towing another and the connection consists of a chain, rope or cable, there shall be displayed upon such connection a white flag or cloth not less than 12 inches square.
4. The foregoing provision of this section shall not apply to the drawbar or other connection between a motor vehicle and pole or pipe dolly.
5. No person shall operate a vehicle towing another when the towed vehicle swerves from side to side dangerously, unreasonably, or fails to follow substantially in the path of the towing vehicle.

Chapter

5

EQUIPMENT/VEHICLES

GENERAL SAFETY RULES

1. Drivers and passengers are required to wear seat belts when operating state vehicles and equipment.
2. All equipment should have the prescribed safety equipment such as lights, flags and warning devices properly installed and operational.
3. Daily inspections should be made on all equipment and necessary action taken to remedy unsafe conditions. (Refer to the Preventative Maintenance Manual, page 53)
4. Regular routine maintenance and operational checks as prescribed by the Equipment and Procurement Division should be performed at prescribed intervals. Information should be readily available and followed. (Refer to the Preventative Maintenance Manual, pages 51-71)
5. Belts, pulleys, sheaves, gears, chains, shafts, clutches, drums, fly-wheels and other reciprocating or rotating parts of equipment should be guarded.
6. Platforms, foot walks, steps, ladders, hand holds, guard rails and toe boards should be installed and used on all equipment where needed to ensure safe ascent and descent.
7. Positive means should be provided to prevent the starting of equipment in any position except from the operator's seat and to prevent the equipment from being started by unauthorized persons.
8. When work is completed, equipment should be set and locked so that it cannot be released, dropped or activated in any manner.
9. Equipment should not be refueled while the motor is running.
10. Smoking or the use of open flames on or in the immediate vicinity of equipment while it is being refueled is prohibited.
11. Solvents with a flash point of 100 degrees Fahrenheit or below should not be used for cleaning parts and equipment. Gasoline, naphtha, toluene and varsol are but a few of the flammable liquids in this category. Kerosene with a flash point of 130 degrees Fahrenheit now contains an additive that can be harmful to the skin and caution should be exercised during its use.
12. Gasoline, fuel oil and other flammable liquids should not be stored on equipment except in fuel tanks or approved safety containers.
13. Fuel tank openings should not be located in such a position that spills or overflows can reach hot motors, exhaust pipes or batteries.
14. When entering and exiting certain vehicles and equipment use the "three-point contact" method: two hands and one foot or two feet and one hand.

15. Equipment supported by hoists or jacks should be blocked before employees are permitted to work underneath.
16. All equipment should have wheel chocks available to be used when repairs are made.
17. Debris, oil, grease, oily rags or waste should not be allowed to accumulate on equipment.
18. Safe load capacity and operating speeds should be posted on cherry pickers, cranes, excavators and front-end loaders and should not be exceeded.
19. The Division Head of Equipment and Procurement may recommend that an employee be restricted from operating any equipment.
20. Immediate supervisors shall have the authority to determine who will operate equipment.

SLOW-MOVING VEHICLES

Tractor /mowers, front-end loaders and any other equipment which operates at a maximum speed of 25 mph or less should be equipped with flashers and/or rotary lights. A slow-moving vehicle emblem may be installed at the discretion of the Division Head or District Engineer.

TRANSPORTING OVERSIZED EQUIPMENT

The Arkansas Highway Commission has established the following regulations for the movement of oversized Department equipment. Such equipment must be moved only during daylight hours. There must be an escort vehicle equipped with flashing lights, and the transport vehicle must bear a sign with the legend "Oversized Load". This equipment must be bound and secured prior to movement so it will not be a hazard on the highway. Red flags are to be used at the point where the load extends over the sides or end of the transporting vehicle. In some cases, if visibility is limited due to the weather, lights should be used along with the red flags.

LOAD SECUREMENT

Cargo

(Example: corrugated pipe, concrete pipe, signs)

- Tie-downs must be adjustable (example: ratchet or binders).
- Each tie-down must be attached and secured in a manner that prevents it from becoming loose, unfastening, opening or releasing while the vehicle is in transit.
- The total working load limit of the tie-downs must be at least one-half times the weight of the equipment being transported (example: 3/8 chain grade 43 = 5,400 lbs. – ½ chain grade 43 = 9,200 lbs.) (example: load weighs 5,000 lbs., at least 2,500 lbs. of tie-downs are needed).
- A minimum of two tie-downs are to be used if the cargo is less than ten feet in length.
- One additional tie down is required for every fraction beyond the first ten feet of length. (example: piece of corrugated pipe with a length of twenty feet, six inches (20' 6"), will need to be secured with a minimum of three (3) tie-downs if a header board is in place and the cargo is positioned to prevent forward movement).
- If a piece of cargo is not positioned to prevent movement in the forward direction by a header board, an additional tie-down is required (In the above mentioned example there would be a total of four (4) tie-downs).

Cargo Placement and Restraint
(Example: concrete or corrugated steel pipe)

- Cargo that is likely to roll must be restrained by blocks, wedges, a cradle or other means to prevent rolling. The means of preventing rolling must not be capable of becoming unintentionally unfastened or loose while the vehicle is in transit.
- Cargo placed beside each other must be placed in direct contact with each other or secured in a way to prevent the load from shifting towards each other.

Motorized Equipment less than 10,000 lbs.
(Example: automobiles, light trucks, van, tractors/bush-hogs)

- A minimum of two (2) tie-downs are required to be mounted on the designed anchor points.
- If there are no anchor points designed for that vehicle, then tie-downs should be affixed as close as practicable to the front and rear of the load.
- Securement should be conducted to prevent movement in all directions.

Motorized Equipment Greater than 10,000 lbs.
(Example: backhoe, excavator, loader)

- All heavy vehicles and equipment must be secured as close to the front and rear of the equipment as possible using a minimum of four (4) tie-downs.
- Accessory equipment, such as hydraulic shovels, buckets and blades must be completely lowered and secured to the trailer.
- Articulated vehicles must be secured in a manner that prevents movement while in transit (example: a loader with locking pins not engaged needs a tie-down).
- The total working load limit of the tie-downs must be at least one-half times the weight of the equipment being transported (example: 3/8 chain grade 43 = 5,400 lbs. – ½ chain grade 43 = 9,200 lbs.) (example: load weighs 30,000 lbs.; at least 15,000 lbs. of tie-downs are needed).

PROHIBITION ON THE USE OF DAMAGED SECUREMENT DEVICES
All tie-downs, cargo securement systems, parts and components used to secure cargo must be in proper working order with no damaged or weakened components, such as, but not limited to: broken, cracked, twisted, bent, knotted, stretched links, damaged floors or anchor points.

ASPHALT EQUIPMENT
MANUFACTURER RECOMMENDED PRECAUTIONS: CAUTION - DANGER
ALL BITUMINOUS MATERIALS ARE FLAMMABLE. FAILURE TO COMPLY WITH THE FOLLOWING PRECAUTIONS MAY RESULT IN A SERIOUS FIRE OR EXPLOSION.

1. Do not light burners unless all flues are covered by six inches of material.
2. Ensure the unit is level.
3. Do not operate burners while hot material is discharging from the tank. Allow burners or combustion tube to cool before spraying the road.
4. Do not open manhole while material is hot.
5. Do not overheat the material; it may flash or burn.
6. Check thermometer periodically.
7. Do not fill the gasoline tank while burners are hot.

8. Do not weld on tank or heat flues before steaming to remove explosive fumes.

REMEMBER: Sparks, hot exhaust pipes or engine backfire may flash hot bitumen.
BE CAREFUL!

The following additional action is recommended to prevent accidents:

1. Replace existing globe valves with plug or gate valves to minimize the need for heating since plug and gate valves are less prone to freeze or stick.
2. Ground all storage tanks.
3. Have a flexible ground from storage tank to mobile unit.
4. Never have personnel on top of a storage tank or distributor holding the hose except at the beginning and end of the operation. Accomplish this by providing an L-type fitting placing one-half of the fitting into the tank opening.
5. Check all valves for proper settings prior to commencing transfer operation. If heat must be applied, provide a fire extinguisher for immediate use.
6. Do not smoke or allow open flame on a tanker or distributor during transfer operation.

Supervisory personnel should assure themselves that all personnel working with asphalt have been informed of the proper procedures and are thoroughly familiar with the proper safety precautions. All burner asphalt distributors and asphalt pots should have a fire extinguisher (dry chemical or CO2) mounted in a location that is easy to access.

The following sizes are recommended for fire extinguishers placed on asphalt equipment:

1000-6000 gallon class - 20 pound minimum
600 gallon class - 10 pound minimum
180 gallon class - 10 pound minimum
176 gallon class - 5 pound minimum

CHAIN SAWS/POLE SAWS

1. Employees must be trained to operate the saw before use.
2. Keep the saw in good condition and easy to start.
3. Never start a saw while standing in a tree, on a ladder, or in any other unstable position.
4. Keep fuel in approved containers.
5. Keep the chain sharp and tight.
6. Keep the chain oil tank full.
7. Watch for kickback (an upward jump or jerk of the saw).
8. Do not carry a saw in the passenger space of a vehicle.
9. Store saws properly, taking care to set level with gas cap up.
10. Keep a loose-fitting sleeve on chain when storing or transporting.

Proper personal protective equipment shall be worn:

CHAIN SAW	POLE SAW
· Eye protection/face shield	· Eye protection/face shield
· Gloves	· Gloves
· Hard hat	· Hard hat
· Chaps (1 pair per saw)	· Chaps (optional)
· Hearing protection	· Hearing protection

VEHICLE OPERATION

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of vehicle before allowing the vehicle to be operated unsupervised.
3. Drivers shall perform a preoperational check of their vehicle in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual.
4. No vehicle shall be operated in an unsafe condition.
5. Drivers and passengers are required to wear seat belts in state vehicles.
6. All loose material such as papers, books, tools, radios and brief cases shall be secured to avoid material falling into the floorboard.
7. Drive defensively, observe speed limits and obey all traffic laws when operating vehicles.
8. Plan ahead to minimize or eliminate the need for backing. If you must back the vehicle, back slowly and check mirrors often.
9. Choose safest location possible to park vehicles. Avoid parking in other vehicle's blind spots.
10. Keep windshield, wipers, side windows and mirrors clean.
11. Clean headlights, taillights and emergency light covers.
12. Remove key from unattended vehicles.
13. Vehicle should not be left running when unattended. If it is necessary to leave a manual transmission vehicle running while unattended (to power warning lights, etc.), the vehicle must be properly secured with wheel chocks in front and back on the same tire.
14. Vehicles in excess of 10,000 lbs are required to have a backup alarm according to the Department's Preventative Maintenance Policy.

CRANE/DRAGLINE

1. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Use caution around power lines.
3. Check boom daily for cracks, deformities, oil leaks or loose pins, nuts and bolts.
4. Check boom hook for cracking or spreading and loose pins.
5. Make a daily check of wire rope, cable or chains for deformities.
6. Before traveling, check boom for proper storage position.

7. Workers shall not be allowed under boom during operation.
8. Never exceed maximum lifting capacity of boom.
9. Only one person shall operate the crane and only one person shall signal and assist the operator.
10. Do not rock the boom and always use a smooth pull.
11. Crane deck shall be kept clean and free of obstructions.
12. When swinging boom, change direction slowly.
13. Do not pull objects directly toward operator position.
14. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
15. Do not use chain and grab hooks when working on mats.
16. Position drop line as close as possible to the balance point of the load.
17. Crane shall be made level before beginning work.
18. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
19. Operators should be aware of employees and others on foot in work zones.
20. Operators should make a visual inspection of work area prior to beginning work.
21. The operator has overall responsibility for the operation and should:
    - know the position of each worker in the operation,
    - avoid placing the boom in a position that will endanger employees,
    - utilize a spotter to keep personnel clear of the boom, and
    - stop operation whenever the spotter or workers cannot be seen.

EXCAVATOR, HYDRAULIC

1. Supervisors shall verify that drivers are capable and are qualified before allowing the equipment to be operated unsupervised.
2. Drivers shall perform a pre-operational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual. Report all needed repairs promptly. Do not use equipment that is unsafe.
3. Operators shall wear seat belts and/or shoulder harnesses as provided.
4. Keep windshield, wipers, side windows and mirrors clean.
5. When mounting or dismounting equipment, use steps and hand holds provided. Do not jump from vehicle.
6. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
7. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
8. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spots.
9. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
10. Operators should be aware of employees and others on foot in work zones and be sure area is clear of personnel before lowering stabilizers or moving the boom.
11. Do not leave attachments in the raised position when equipment is not in use. Always lower them to the ground.
12. When in operation, only the operator should be permitted on the machine.

13. Be sure outriggers are properly set before operating backhoe.
14. Never allow anyone to work under a raised bucket.
15. Use caution around power lines.
16. Before digging, review excavating, trenching and shoring guidelines.
17. Operators should make a visual inspection of work area prior to beginning work.

FORK LIFT

1. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
3. Rated capacity must be stated on forklift. Do not overload.
4. Riders shall not be permitted on forklifts.
5. Loaded forklifts shall not be moved until load is safe and secure.
6. All unattended forklifts shall have mast at vertical position, forks in the down position, engine off and parking brake set.
7. Forklifts shall not be driven up to anyone standing in front of a bench or fixed object where such person could be caught between the forklift and object.
8. Operators shall look in the direction of travel and not move forklift until certain that all persons are clear.
9. The forks shall always be carried as low as possible. Make sure counterweights are in place.
10. Forklifts shall not be driven into and out of trailers at loading docks until such trailers are securely blocked and brakes set.
11. Employees shall not place any part of their body outside the running lines of the forklift or between mast uprights or other parts of the unit where shear or crushing hazards exist.
12. Employees shall slow down and sound horn at all locations where visibility is obscured or obstructed. If the load being carried obstructs forward view, the operator shall be required to travel with the load trailing. Avoid sharp turns and sudden starts and stops.
13. Employees shall not be allowed to stand, pass, or work under the elevated portion of any forklift.
14. Extreme care shall be taken when tilting loads. Tilting forward with forks elevated shall be prohibited except when picking up a load. Tilting elevated loads forward shall be prohibited, except where the load is to be deposited on a storage rack or equivalent.
15. Special precautions shall be taken in the securing and handling of loads by forklifts equipped with special attachments, and during the operation of these trucks after loads have been removed.
16. Employees shall only be lifted in forklifts designed specifically for this use.
17. When the forklift is in motion, the masts should be tilted. When forks are empty, mast should be tilted to the rear to prevent tips of forks from contacting ground. When the forklift is parked, the tips should be flat on the ground.
18. Check overhead clearance of doorways and entrances.
19. If equipment has air brakes, be sure pressure is up before moving.

MOTOR PATROLS

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Keep windshield, wipers and mirrors clean.
4. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
5. When operating, be aware of protruding or overhanging objects or limbs.
6. When traveling, make sure blade is properly positioned under grader. Slow down when crossing railroad tracks.
7. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
8. Always be on the lookout for hazards in or adjacent to the travel way, such as bridge joints, curbs, manhole covers and other utilities.
9. Operators shall wear lap belt while seated or standup harness while standing, if possible.
10. Tire chains should be utilized as dictated by weather conditions.
11. Operators should be aware of employees and others on foot within work zone.
12. When in operation, only the operator shall be permitted on the machine.
13. Operators shall never allow machine to coast downhill with transmission in neutral.
14. Use extreme caution when operating grader on steep slopes or along the edge of fills to avoid overturning.
15. Grader should be parked with blade in down position. Shut off engine when equipment is not in use.
16. If operating grader with door open, make sure it is properly fastened. Do not attempt to open or close door when moving.
17. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spot.
18. When deadheading, use low volume roadways if available. Pull over to allow vehicles to pass.
19. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.
20. All motor patrols must have an amber warning light and a minimum of two orange flags. Flags should be mounted on each upper corner of mold board.

LAWN EDGERS/WEED EATERS

1. Follow precautions for working with other small or air-cooled gasoline engines.
2. Stay clear of blade.
3. **Always wear personal protective equipment!**

LAWN MOWER

1. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Program. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Check condition of drive belts before starting.
3. Check area and clear rocks and debris before mowing.
4. Clear all persons from path of potential flying objects.
5. Avoid entangling blade in wires, ropes, or cables.
6. Make sure seat is properly secured to machine.
7. Make sure mower is in neutral or park before starting.
8. Do not carry passengers on mower.
9. Use mower only for its designed purpose.
10. Use care while operating over uneven terrain.
11. Do not dismount machine unless stopped.
12. Disengage mower when not cutting.
13. Keep feet and hands clear of mower blades.
14. Do not refuel a running or hot engine.
15. Keep all guards in place at all times.
16. Keep off slopes too steep for safe operation.
17. Never attempt to start or operate the machine except from the operator's station.
18. Check frame and mower deck for cracks and loose bolts.
19. Stop the engine when leaving the mower, even for a moment.
20. Do not unclog mower while it is running.
21. **Always wear Personal Protective Equipment**!

LOADER, FRONT END

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
3. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
4. Operators shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. Make visual inspection of work area before starting operations.
7. When in operation, only the operator shall be permitted on the machine.
8. Carry bucket low to ground (loaded or unloaded).
9. Stop loader with brakes, not transmission.
10. Do not operate the loader or controls from any position other than the operator's seat.
11. Plan ahead to minimize the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
12. Operators should be aware of employees and others on foot in work zones.
13. Do not swing bucket over truck cab or ground crew.
14. Build berm prior to dumping over banks.

15. When operating machine on the side of a hill, never allow anyone to remain down slope while machine is in motion.
16. Never allow machine to coast downhill with transmission in neutral or with clutch pedal depressed.
17. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spots. Properly secure equipment.
18. Engage safety steering lock while holding and before working on loader.
19. Always lock equipment properly when parking overnight or for an extended period.
20. When deadheading, use low volume roadways if possible. Pull over to allow vehicles to pass.
21. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

CENTERLINE PAINT MACHINE (STRIPER)

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and or shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and hand holds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
8. Plan ahead to minimize or eliminate the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spots.
10. Always be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
11. Operators should be aware of employees and others on foot in work zones.
12. When doing emergency maintenance, be aware of hazards as a result of other vehicle traffic and to other personnel.
13. Always be aware of overhead obstructions.
14. When operating vehicle off the roadway, be aware of hidden objects in the grass and unstable terrain.
15. Check paint valves and hoses for wear and leaks.
16. Be sure there is no pressure on paint system when setting up, cleaning, pulling filters, or servicing guns.
17. Choose place for setting up away from traffic, if possible.
18. No smoking or open flames allowed in immediate area of pumping paint.
19. When securing at end of day, bleed entire system of pressure. Never leave pressure in system. Check air valves and hoses for wear and leaks.
20. Do not use pressurized air to clean yourself.

21. Have a communication system between driver and operator.
22. Release pressure on bead tank, paint and solvent tanks before removing lid.
23. Always be aware of fire hazards from paint and solvents, overflow onto furnace.
24. The use of shadow vehicle with impact attenuator is recommended for high volume roadways.
25. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

PAVEMENT GRINDER

1. Operators shall perform a pre-operational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Check cutting teeth before operating and familiarize yourself with equipment controls and their functions.
3. Never attempt to start or operate the machine except from the operator's station.
4. Operators and passengers, if equipped with passenger seating, shall wear seat belts and/or shoulder harnesses as provided.
5. Never stand behind or in front of the machine when the engine is being started or grinding pavement. Grinders may lunge unexpectedly.
6. Always use two employees when loading or unloading equipment. When preparing for transport, place block of wood under grinder head after equipment is loaded on trailer.
7. Before adjusting, lubricating or fueling the equipment, move the grinder drum engagement lever to the off position, set the brake, shut off the engine and block the wheels if on an incline.
8. Always come to a complete stop and stop grinder head before reversing the direction of the machine while grinding.
9. Always use caution when turning or crossing near traffic. The machine moves slowly and requires more time to maneuver than other equipment.
10. Always align the rear wheels with the frame when deadheading the machine.
11. Always be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
12. Keep machine clean.
13. Always use water when grinding.
14. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
15. Stay clear of all moving parts, cables, shafts belts, flywheels, etc.
16. Plan ahead to minimize the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
17. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.

PAVING MACHINE/WIDENER

1. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
3. Proper use of cleaning agents is imperative.
4. One person only shall direct truck drivers backing into or leaving paver.
5. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from equipment.
6. Never attempt to start or operate the machine except from the operator's station.
7. Always be aware of hot places on paver to avoid burns.
8. Do not leave paver unattended when heating screed.
9. Use caution when loading/unloading paver from trailer, especially in wet or damp conditions.
10. When transporting paver on trailer, check to be sure load is properly secured.
11. Always be aware of fire extinguisher locations on equipment and make sure they are properly charged.
12. Stay clear of all moving parts, cables, shafts, belts, flywheels, etc.
13. Operators should be aware of employees and others on foot in work zones.
14. Use caution when handling hot/flammable materials. Review MSDSs for each material used.

PORTABLE ROLLERS

1. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
3. Never attempt to start or operate the machine except from the operator's station.
4. Remain in seat while operating. Wear seat belt if equipped with rollover protection.
5. When mounting or dismounting equipment, use steps and hand holds provided. Do not jump from equipment.
6. Choose safest location to park equipment. Avoid parking in other equipment's blind spot.
7. When in operation, only the operator shall be permitted on the machine.
8. Use caution when operating roller on steep grades.
9. Keep area clear when operating roller. Be aware of location of any stationary objects in area.
10. Always completely stop roller before changing directions.
11. Operator should be aware of employees and others on foot in work zones.
12. Do not allow anyone to get between roller and truck while coupling.
13. When rolling patches or edges, do not get too close to edge of pavement to avoid rollover.
14. Hook and unhook patch rollers on stable ground. Use a guide when hooking to vehicle. Set parking brake on roller to prevent bending hydraulic tongue. Chocks should be used on slopes.
15. Use locking pins when wheels are in up or down position.
16. After disconnecting, both roller drums should be on ground.
17. Use caution when loading/unloading steel wheel roller from trailer especially in wet or damp conditions.
18. Before transporting make sure steering roller is locked into position.

19. When transporting roller on trailer, check to be sure load is properly secured.
20. Observe recommended towing speed limit of the machine.
21. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
22. Operator should be aware of employees and others on foot in work zones.

ROLLERS, RUBBER-TIRED/VIBRATORY

1. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
3. Remain in seat while operating. Wear seat belt if equipped with rollover protection.
4. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from equipment.
5. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spot.
6. When in operation, only the operator shall be permitted on the machine.
7. Use caution when operating roller on steep grades and fill edges.
8. Keep area clear when operating roller. Be aware of location of any stationary objects in area.
9. Always completely stop roller before changing directions.
10. Operator should be aware of employees and others on foot in work zones.
11. Use guide when hooking towed sheep foot or vibratory roller to tractor. Check pin and coupling for wear.
12. Never attempt to start or operate the machine except from the operator's station.
13. Check sheep foot roller periodically and remove roots, wire, rock, etc. caught between feet.
14. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
15. Plan ahead to minimize the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
16. Make sure equipment is properly secured prior to transporting.

SNOOPER CRANE

1. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Use caution around power lines.
3. Check boom and boom hook daily for cracks, deformities, oil leaks or loose pins, nuts and bolts.
4. Make a daily check of wire rope, cable or chains for deformities.
5. Before traveling, check boom for proper storage position. Never travel with PTO engaged.
6. Never exceed maximum lifting capacity of boom in its different positions.
7. Only one person shall operate the boom and only one person shall signal and assist the operator.

8. Check and use outrigger safety locks and warning lights. Keep outriggers in sight while lowering.
9. Do not operate boom unless outriggers are down. Do not use outrigger for lifting.
10. When swinging boom, change directions slowly. Do not rock the boom.
11. Operators should be aware of employees and others on foot in work zones.
12. When working in bucket, hard hats and safety harnesses must be worn. Always use Personal Protective Equipment when working over water.
13. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
14. Safety harness must be attached when entering/exiting buckets.
15. All unauthorized personnel shall be kept clear of the operation.
16. Workers shall not be allowed under boom during operation.
17. Check load capacity of the bridge before operating a snooper crane from the deck.
18. All drivers shall be properly licensed.
19. Keep windshield, wipers, side windows and mirrors clean.
20. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion unless the vehicle is designed to accommodate an individual outside the cab.
21. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
22. Plan ahead to minimize the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
23. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
24. If employees are working 6 feet or more above ground, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

TRACTOR, CRAWLER

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
4. Operator should make a visual inspection of work area prior to beginning work.
5. When in operation, only the operator should be permitted on the machine.
6. Plan ahead to minimize the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
7. Never allow machine to coast downhill with transmission in neutral.
8. When involved in clearing operations, operator should be conscious of possible falling debris. An observer shall be used when visibility is obstructed.
9. Operator should lower ripper and blade to the ground, set foot brake and lock transmission whenever machine is parked.

10. When operating on a side slope, never allow anyone to remain down slope while machine is in motion.
11. Operators and passengers, if equipped with passenger seating, shall wear seat belts and/or shoulder harnesses as provided.
12. Operator should be aware of employees and others in the work zone.
13. Never attempt to start or operate the machine except from the operator's station.
14. Make sure equipment is properly secured prior to transporting.
15. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spot.
16. Always be aware of fire extinguisher locations on your equipment and make sure they are properly charged.

TRACTOR, BACKHOE AND LOADER

1. Supervisors shall verify that drivers are capable and qualified before allowing the equipment to be operated unsupervised.
2. Drivers shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
3. Operators shall wear seat belts and/or shoulder harnesses as provided.
4. Keep windshield, wipers, side windows and mirrors clean. Make sure that the mirrors provide the largest possible view of the rear.
5. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
6. Plan ahead to minimize or eliminate the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
7. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spots.
8. Always be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
9. Operators should be aware of employees and others on foot in work zones and be sure area is clear of personnel before lowering stabilizers or moving the boom.
10. Do not leave attachments in the raised position when equipment is not in use; always lower to the ground.
11. When in operation, only the operator should be permitted on the machine.
12. Always be sure outriggers are properly set before operating backhoe.
13. Never allow anyone to work under a raised bucket.
14. Use caution around power lines.
15. Utilize trailer whenever possible to transport backhoe. Use swing and boom locking pins when transporting.
16. Make sure equipment is properly secured prior to transporting.
17. Before digging, review excavating, trenching and shoring guidelines.
18. When operating on slopes, use caution when swinging bucket in the downhill direction. Dump on the uphill side. Keep loader bucket low when moving.
19. Select loading areas that are as level as possible.

20. Do not leave equipment unattended with the engine running. Shut off engine lower buckets and set the parking brake when equipment is not in use.

TRACTOR, MOWER

1. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Watch traffic when driving around guide markers, signs, culverts, etc. or anytime machine encroaches on travel lane.
4. Don't mow too close to fences and be alert for utility pole guide wires, concrete right of way markers, etc.
5. Use caution when mowing on steep slopes. Watch for hidden holes or washouts and reduce speed.
6. Use caution when mowing downhill on wet or green grass, as brakes are less effective.
7. Shut off tractor when performing equipment repair activities.
8. Keep area clear of personnel on foot.
9. Do not dismount unless motor is off, blades have stopped and brake is set.
10. Never work under mower unless blades have been disengaged and mower has been properly secured with safety stand or safety chain.
11. Keep mower adjusted to proper height above ground to prevent throwing debris.
12. Do not run side mount flail in the up position.
13. Replace missing flail knives to maintain balance.
14. Ensure debris guard is in place and in good condition.
15. Use caution not to place equipment in locations where it is subject to getting stuck.
16. Never attempt to start or operate the machine except from the operator's station.
17. Operators shall wear seat belts and/or shoulder harnesses as provided.
18. Stay clear of all moving parts, cables, shafts, belts, flywheels, etc.
19. Check frame for cracks and loose bolts.
20. Mower operators should familiarize themselves with this section.
21. Remove key when servicing.
22. Direct mower discharge toward the ditch or back slope and away from employees or pedestrians.
23. DO NOT allow anyone other than the operator to ride on a tractor.
24. Maintain a distance of at least 300 feet between mowers moving in the same direction.
25. Ensure that all mowers are furnished with a chain curtain or belting guard in the front and rear to protect the opening but where the guards cannot come into contact with the mower blades.
26. Ensure that a screen guard is installed behind the operator on rear-mounted mowers.
27. Ensure that tractors are equipped with rollover protection and that seat belts are installed and worn. Do not operate tractors without rollover protection and seat belts.
28. Consider disengaging mowers when crossing driveways and intersecting roads.
29. Ensure that mowers have orange flags and amber safety lights in operation when mowing near the travel lanes or shoulders.
30. Use advance warning signs preceding mowing operations.

31. Keep fully charged fire extinguishers in the vehicle attending a fleet of mowers.
32. Turn off tractor engine and set the brake whenever someone is standing beside the tractor.
33. Secure mower wings when they are raised.

'Roading' the Mower

- Lock tractor brake pedals together
- Use the safest high gear and range
- Obey traffic rules and regulations
- Use warning lights
- Pull off roadway into a safe area to let traffic pass, when necessary.

TRUCK, CRANE

1. All drivers shall be properly licensed.
2. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
4. Use caution around power lines.
5. Check boom and boom hook daily for cracks, deformities, oil leaks or loose pins, nuts and bolts.
6. Make a daily check of wire rope, cable or chains for deformities.
7. Before traveling, check boom for proper storage position. Never travel with PTO engaged.
8. Never exceed maximum lifting capacity of boom in its different positions. Refer to load chart.
9. Only one person shall operate the boom and only one person shall signal and assist the operator.
10. Check and use outrigger safety locks and warning lights. Do not use outrigger for lifting. Keep outriggers in sight while lowering.
11. Do not operate boom unless outriggers are down.
12. Use timber under outriggers for support when operating on soft ground.
13. When swinging boom, change direction slowly. Do not rock boom and always use a straight pull. Do not use boom to push or boom swing to pull.
14. Do not pull objects directly toward operator position; use remote control for the boom.
15. Do not use chain and grab hooks.
16. Operators shall wear seat belts and/or shoulder harnesses as provided.
17. Keep windshield, windshield wipers, side windows and mirrors clean.
18. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
19. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
20. Plan ahead to minimize the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.

TRUCK, CREW CAB AND FLATBED

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified before allowing the equipment

to be operated unsupervised.

3. Drivers shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
8. Plan ahead to minimize or eliminate the need for backing. If you must back the vehicle, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spots.
10. Always be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
11. Operators should be aware of employees and others on foot in work zones.
12. Make sure cargo is properly loaded and secured with no less than two chains. Hauled vehicles shall be secured with chains pulling from opposite directions. (Refer to Load Securement section of this manual.) Check for loose material on truck body and chassis.
13. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
14. When operating vehicle off the roadway, be aware of hidden objects in the grass and unstable terrain.
15. Provisions should be made for proper tool and sign storage.
16. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.

TRUCK, DUMP

1. Supervisors shall verify that drivers are capable and qualified before allowing the equipment to be operated unsupervised.
2. All drivers shall be properly licensed.
3. Drivers shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe
4. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
8. Plan ahead to minimize or eliminate the need for backing. If you must back the vehicle, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spots.
10. Always be aware of fire extinguisher locations on your equipment and make sure they are

properly charged.

11. Operators should be aware of employees and others on foot in work zones.
12. Always be aware of crushing and pinching hazards when installing, adjusting or removing tailgates. Get help or use machinery as necessary.
13. Make sure cargo is properly loaded, secured and covered. Check for loose material on bed rails and chassis.
14. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
15. Always be aware of overhead utility lines when spreading material.
16. When operating vehicle off of the roadway, be aware of hidden objects in the grass and unstable terrain.
17. Never work under bed when raised without proper bracing in place.
18. Make sure tailgate is unlatched prior to raising bed for dumping and avoid dumping on unlevel side hill terrain.
19. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

TRUCK, FIELD MECHANIC

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified before allowing the equipment to be operated unsupervised.
3. Operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion.
8. Plan ahead to minimize or eliminate the need for backing. If you must back the vehicle, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spot.
10. Always be aware of fire extinguisher locations and make sure they are properly charged.
11. Operators should be aware of employees and others on foot in work zones.
12. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
13. When operating vehicle off the roadway, be aware of hidden objects in grass and unstable terrain.
14. Do not smoke around flammable liquids.
15. Remove regulator valves and install tank caps on oxygen and acetylene tanks when transporting.
16. Make sure cargo is properly loaded and secured. Check for loose material on truck body and chassis.
17. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.

18. Field mechanic's truck and equipment being serviced should be completely off roadway. If this is not possible, determine traffic control needs from MUTCD.

TRUCK, HERBICIDE

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers and operators are capable and qualified before allowing the equipment to be operated unsupervised.
3. Drivers and operators shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Watch for side clearance and conflict with fixed or moving objects while using or adjusting boom. Properly secure boom while not in use.
5. Check packing glands on agitator shafts for leaks.
6. Avoid splashing. Do not overfill tank. Test pump and system and calibrate before adding chemical.
7. Check frame for cracks and loose bolts.
8. Chemical containers must be labeled and spray trucks must have labels in the cab area.
9. Safety shutoff valves shall be installed on all outlets.
10. Use proper loading, mixing and application procedures according to labels. Apply tank mix to target areas only.
11. Handle spills according to label directions.
12. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
13. Keep windshield, wipers, side windows and mirrors clean.
14. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
15. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is engaged in normal work operation, i.e. herbicide spraying, blowing mulch, etc.
16. Plan ahead to minimize or eliminate the need for backing. If you must back the vehicle, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
17. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spots.
18. Always be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
19. Operators should be aware of employees and others on foot in work zones.
20. When operating vehicle off of the roadway, be aware of hidden objects in the grass and unstable terrain.
21. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
22. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

TRUCK, TRACTOR AND TRAILER

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified before allowing the equipment to be operated unsupervised.
3. Drivers shall perform a preoperational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
8. Plan ahead to minimize or eliminate the need for backing. If you must back the vehicle, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spots.
10. Always be aware of crushing and pinching hazards when installing, adjusting or removing chains and binders used to secure loads.
11. Make sure cargo is properly loaded and secured using only approved chain and load binders. Refer to Load Securement Section of this manual.
12. Always be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
13. Drive defensively, observe speed limits and obey all traffic laws.
14. Operator should always check and be aware of load height.
15. Hook/unhook, load/unload on stable ground with trailer secure.
16. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
17. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.

WORK BOAT

Before Launching

1. Check weather forecast prior to leaving dock.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a preoperational check of their equipment. Be familiar with the operator's manual. Report needed repairs promptly.
4. U.S. Coast Guard requires all boats to have personal floatation devices (PFDs) for all passengers. PFDs **shall** be worn at all times.
5. Boats must be equipped with a first aid kit.
6. Brief new personnel on safety equipment use and location.
7. Make sure drain plugs are in place.
8. Have sufficient fuel on board for trip. When fueling, switch off engines, do not use electrical switches, extinguish all open flames and avoid overflow.
9. Always be sure bow line is attached to bow and secured before backing down launch ramp.

10. When applicable, carry radio when working from boat.
11. Make a visual check of hull for rips, tears or holes.

After Launching

1. Monitor weather for changing conditions.
2. Check for water leakage from hull or engine.
3. Control speed and obey all speed limit signs. Manage wake at all times.

BOAT TRAILER

1. Back up to trailer with assistance of another person.
2. Check condition of hitch, safety chain, electrical lines, winch and winch cable.
3. Make sure winch is in locked position before moving trailer and boat.
4. Check for proper alignment of boat on rollers and V-block.
5. Check condition of trailer wheels and brakes.
6. Always be sure boat is secure before moving.

WRECKER

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment in accordance with the Department's Preventative Maintenance Policy. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion.
8. Plan ahead to minimize or eliminate the need for backing. If you must back the vehicle, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment's blind spot.
10. Do not overload truck, and always use proper engine speed and gear ratio.
11. Never travel with the power-take-off (PTO) control engaged.
12. When the boom is raised, never put the selector in the down position and let go of the crank. A runaway crank would result. Never use the crank when the boom has a load on it.
13. Never disengage the wrecker service drum engagement control when the cable is loaded.
14. Never apply lubricant or perform any kind of maintenance while wrecker equipment is operating.
15. Always unlatch the hood of the disabled vehicle when lifting its front end. Leave the safety catch engaged.
16. Always turn on flashing lights in traffic when towing disabled equipment.
17. Stay clear of all moving parts, cables, shafts, belts, flywheels, etc.
18. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
19. Always be aware of fire extinguisher locations on your equipment and make sure they are properly charged.

20. If disabled equipment cannot be removed from roadway, then determine traffic control needs from the MUTCD.
21. Operators should be aware of employees and others on foot in work zones.
22. Check boom daily for cracks, deformities, oil leaks or loose pins, nuts and bolts.
23. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.

AIR COMPRESSOR

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of all air hoses, couplings and connections to determine if leakage or other damage exists. Be familiar with operator's manual. Do not operate unsafe equipment.
3. Choose safest location to place compressor unit or compressor vehicle within work area.
4. Use wheel chocks to prevent runaways.
5. Decompress air from compressor prior to removing any caps or air equipment attachments such as jackhammers, drills, etc.
6. Keep oils and flammable materials clear of air fittings and joints.
7. Watch for flying sand and other debris when operating compressor. Be aware of wind direction and try to work upwind if possible.
8. Operators should be aware of employees and others on foot in work zones.
9. Make sure the hose connections are secure to avoid hose coming loose during use. High pressure air can cause serious injury.
10. Pressure-relief valve should be checked and the pressure relieved before transporting.
11. At the end of each shift, compressor should be shut down, air receiver condensation drain valve opened and the system allowed to bleed down. Valve should remain open until the system is restarted and air begins to blow off.

ATTENUATORS, TRUCK MOUNTED

1. Operators shall perform a preoperational check of their equipment. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Hook and unhook on level ground.
3. Keep attenuator wheels blocked when attenuator is not mounted to the truck if so equipped.
4. While operating, be aware of overhang, especially when adjacent to guardrails or fixed objects. Move out gradually.
5. Always be aware of excessive overhang while backing.
6. Understand that the attenuator, although it protects our driver and the public, will not lessen vehicle roll-ahead if hit from behind.
7. Keep attenuator in the down position while shadowing; raise before deadheading.
8. All repairs and adjustments should be made away from the travel way.
9. Drive carefully while deadheading.
10. Wear seat belt and shoulder harness when operating truck.

BRUSH CHIPPER

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. As applicable, the chipper should be positioned as far from travel lanes as is feasible. Operations visibility can be enhanced through the use of proper traffic warning and control such as signs, cones and barrels. Consult the applicable traffic control guidelines.
3. Work vehicles should be positioned to minimize the risk of injury from intruding traffic.
4. Operators shall perform a preoperational check of their equipment. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
5. Avoid wearing loose clothing.
6. Ensure that all shields, covers and guards are in place and secure.
7. Ensure that all bystanders are at a safe distance from equipment.
8. Never allow hands to enter the in-feed spout. Do not stand directly behind machine while operating.
9. Turn engine off and remove key before making any adjustments or repairs.
10. Ensure safety chains are hooked before towing.
11. Feed short material into chipper by placing it on top of longer material that is feeding into chipper.
12. Never leave machine unattended with the engine running. Shut engine off when not in use.
13. Never try to force-feed larger materials into the chipper than it is designed to accept.
14. Always be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
15. Always be aware of employees and others in work area. Only those employees feeding brush should be near chipper.
16. Ensure chipper discharge is turned in a safe direction.
17. Personal protective equipment shall be worn. This should include but not be limited to gloves, eye protection/face shield, hard hat and hearing protection.

CONCRETE SAW

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of their equipment. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Use correct amount of water while operating blade in the cut mode.
4. Check all water hoses for cuts and leaks.
5. Keep all safety guards in place while operating.
6. Check blade nuts for tightness.
7. Do not force or bind blade in slot being sawed.
8. Do not raise protective shield from around blade when operating saw.
9. When installing or changing blade, disconnect spark plug.
10. Operate engine at proper speed. Never alter the rpm or governor setting.
11. Operators should stand away from and to the side of the blade when in use.
12. Use proper procedures for lifting and transporting the equipment. The blade will be disengaged or removed while loading and unloading the equipment.
13. Do not fill fuel tank or remove fuel cap while engine is running.
14. Never leave machine unattended with the engine running. Shut off engine when not in use.
15. Personal protective equipment shall be worn. This should include but not be limited to gloves, eye protection/face shield and hearing protection.

GENERATOR

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. Guard against electric shock.
3. Avoid touching live terminals or receptacles.
4. Always be extremely careful if operating in inclement weather.
5. Do not make or break electrical receptacle connections under load.
6. Use only grounded receptacles and extension cords. Discard old cords.
7. Generator must be properly grounded.
8. Operators should use caution and remain alert around hot engine parts, moving parts and generator output.
9. Provide safety guards for all drive systems.
10. Keep all safety guards and power shields in position and tightly secured.
11. Do not wear loose clothing, neckties or jewelry that could be caught in moving parts.
12. Provide adequate ventilation when in use.
13. Keep area around generator clean and dry. Remove all material that can create slippery conditions. Remove oily rags and other flammable material from the area.
14. Keep a fire extinguisher near the generator.
15. When transporting, ensure that generator is properly secured.
16. Do not fill fuel tank or remove fuel cap while engine is running.

POWER WASHER

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of their equipment. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Insure all connections are correctly attached and tight.
4. When using an intake hose, make sure hose is not drawing mud, sand or other bottom material into the pump system.
5. When using 0 and 15 degree tips for the powerhead/wand assembly, be extremely careful not to direct flow towards air hoses, safety lines, equipment or other personnel. Remember that these tips force water at a velocity high enough to cut through concrete.
6. Always be aware of slippery conditions.
7. Never leave equipment unattended with the engine running. Shut engine off when not in use.
8. Operator should make a visual inspection of work area prior to beginning work.

SEWER FLUSHER

Daily Safety Inspection Procedures Before Operation:

1. Before each operation of the Sewer Flusher, the entire machine should be checked thoroughly for wear areas, loose parts, or any other items that could cause problems during operation.
2. Do not start engine. Checkpoints should be made with the power and/or PTO off, with pump control in neutral position. Failure to do so could result in operator becoming entangled in moving parts.
3. Check oil in pump.
4. Check suction valves on the hydraulic tank and make sure they are in open position.
5. Check for proper hydraulic oil level. Fill as necessary.
6. Inspect the water pump strainer and clean as necessary.
7. Check the water valve between the water tank and water pump. Make sure it is the open position.
8. Water level in tank should be filled to a level above the head of the pump. This will insure proper priming of the pump.
9. Inspect the tank for foreign material or scale. Clean as necessary.
10. Check air purge valve. Make sure it is in the closed position.
11. Inspect all hose and piping for damage and leaks. Replace as necessary.

Daily Safety Inspection Procedures During Operation:

1. Position hose guides over the center of manhole.
2. Use tiger tail hose protector on lip of culvert or pipe to reduce wear on hose.
3. Always connect Ignition key strap to belt loop when operating sewer flusher.
4. Always wear hard hat and gloves when operating sewer flusher.
5. With engine at idle, pull water valve handle to pressure position. This lets water fill the hose and pressure will begin to rise. Gradually open throttle until desired pressure is reached.
6. Mark hose ten feet (10') from end of hose/nozzle to alert operator that end of hose is near end of culvert/pipe when retracting hose.
7. Never retract hose out of culvert/pipe with pressure on.

SNOW PLOW

1. Operators shall perform a preoperational check of their equipment. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
3. Inspect plows and components prior to use as follows and repair or replace any items found to be deficient.
    a. Check plow, plow frame and shear flange for cracks, broken welds or loose bolts.
    b. Check shear flange and pins for proper bolt grade, size, tightness and condition.
    c. Check safety chains and blade for wear and condition.
    d. Check for leaky or damaged hydraulic lines, fittings or cylinders.
    e. Check lube points and lube as needed.
    f. Check all controls to ensure smooth and correct operation.
4. Be aware of pinch points when installing or removing plows. Keep your hands away. Do not lift with your back. Get help and use lifting equipment as needed.
5. Always use safety chains or protective blocking when changing blades or performing other work on plows; never trust the hydraulic system!
6. Adjust your plowing speed to the conditions, i.e. traffic volumes, pedestrians, highway conditions, material to be plowed, terrain and visibility.

7. While plowing, watch for bridge joints, water meters, manholes, railroad tracks, etc.
8. Check the condition of the plow periodically.
9. The use of flags on ends of plow is recommended for higher visibility.
10. When possible, plow operators should inspect plowing route and note or mark hazards.
11. For long distance travel (outside normal work area), the snow plow should be chained in the up position to relieve stress on the cylinder and lifting mechanism.

SPREADER, SALT

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of their equipment. Be familiar with operator's manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
3. Make sure lighting is working properly on truck and spreader.
4. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
5. Keep hands and body away from all moving parts and be aware of pinch points.
6. Never make any repairs or adjustments on the unit while it is in operation.
7. All personnel must keep clear of spread area.
8. Disengage PTO and depressurize all lines before disconnecting.
9. Make sure spreader is properly secured to truck prior to beginning operation.
10. Do not exceed weight limitations.
11. Obtain assistance when installing and removing spreader from truck as needed.
12. Plan ahead to minimize the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
13. Spreader shall be calibrated consistent with predetermined application rate.
14. Spreader is to be cleaned and lubricated following each use.

SPREADER, MATERIAL (AGGREGATE)

1. Supervisors shall verify that drivers are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of their equipment. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe. Make sure lighting is working properly on truck and spreader.
3. Plan ahead to minimize or eliminate the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
4. Insure that hook latch is engaged when spreader is attached to truck.
5. Spreader shall be calibrated consistent with predetermined application rate.
6. Keep hands and body away from all moving parts and be aware of pinch points.

SPREADER, TAILGATE

1. Supervisors shall verify that drivers are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of their equipment. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe. Make sure lights are working properly on truck and spreader.
3. Plan ahead to minimize or eliminate the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer if available. Make sure backup alarms are working properly.
4. Always be aware of crushing or pinching hazards when installing, adjusting or removing spreader. Get help or use machinery if necessary.
5. Make sure spreader is securely attached prior to beginning operation.
6. Spreader shall be calibrated to be consistent with predetermined application rates.
7. Spreader is to be cleaned and lubricated after each use.
8. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
9. Disengage PTO and depressurize all lines before disconnecting.
10. All personnel must keep clear of spread area.
11. Eye protection is required when calibrating spreader. A safety vest shall be worn when out of the vehicle.

TRAILERS AND TOWED EQUIPMENT

1. Supervisors shall verify that operators are capable and qualified before allowing the equipment to be operated unsupervised.
2. Operators shall perform a preoperational check of their equipment. Be familiar with the operator's manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Operators shall perform a visual and manual check of the pintle hooks to ensure that they are secure before the truck and attachment are put to use.
4. Make sure cargo is properly loaded and secured using only approved chain and load binders. Safety chains are to be used on any attachment in tow. Ensure that the chains are of the proper strength for the load and are properly secured to both the vehicle and attachment to be towed. Ensure 10% load weight is on trailer tongue. Refer to Load Securement Section of this manual for additional information.
5. Always be aware of height and width of load.
6. Never load a trailer beyond its recommended capacity.
7. Do not allow anyone between truck and trailer when backing to hook trailer.
8. Plan ahead to minimize the need for backing. If you must back the equipment, back slowly and check mirrors often. Use an observer when available. Make sure backup alarms are working properly.
9. Make sure trailer bed and ramps are clear of any debris.
10. Make sure tilt-beds or ramps are secure before putting trailer in use.
11. Hook, unhook, load and unload on stable ground with trailer secure.
12. Be sure taillights and turn signals are in view when towing any attachment that does not have taillight hookup.

FERRIES

1. Keep advance warning signs in good condition at all times.
2. Make the ferry fast by the provided mooring lines. Do not substitute leaving the engine running and holding the ferry by apron only. This is considered an unsafe practice.
3. Adjust the ferry apron at all times so the crank case of vehicles will not drag when loading and unloading.
4. Ensure that safety cables are no smaller than one-half inch (½) equipped with a commercial hook of hard metal. Keep them in place at all times while the ferry is in motion and when vehicles are loading and unloading.
5. Lower the safety traffic gate across the road while the ferry is away from the landing. At night, affix a red flashing light or red lantern to the gate.
6. Keep fire extinguishers properly filled and in their proper places at all times.
7. Provide life preservers and keep them in an approved water-tight locker. Ensure that signs indicating where life preservers can be found are placed in conspicuous places on the ferry.
8. Keep all hatches covered at all times while the ferry is in operation.
9. Keep cable guards in place at all times while the ferry is in operation.
10. Do not allow vehicles with faulty brakes on the ferry.
11. Ensure that all vehicles have motors stopped while the ferry is in motion.
12. Keep navigation and safety lights in good operating condition at all times.
13. Securely chock vehicles at each end of the ferry.
14. Request drivers of hazardous cargo vehicles to present documents or evidence attesting to the true nature of the cargo.
15. Ensure that the operator of a hazardous cargo vehicle remains with it and follows all instructions of the ferry operator.
16. When vehicles are carried that must keep their engines running in order to operate air conditioning/refrigeration machinery such as ambulances, ensure that they are individually chocked, that the brakes are set and that the vehicle is loaded so that the exhaust does not threaten persons on board. Also, ensure that the vehicle is not located near any areas of potential flammable vapor build-up.
17. Provide lane markings on all vessels capable of carrying two or more vehicles abreast. Markings promote uniform loading and allow room for passengers to exit from their vehicles in case of an emergency.
18. Ensure that the ferry has a double barrier, cables or chains, mounted at each end and that both are secured during the operation of the vessel.

WINCH OPERATIONS

1. No employee of the Department should operate a winch unless they are thoroughly versed in all phases of its operation.
2. All employees assisting in a winching operation are under the direction of the winch operator. The operator should see that all hitches or slings are applied in a safe and efficient manner.
3. Inspect and oil all sheaves and pulley pins frequently. Use only cables that are approved for winch operations. Oil cables frequently for added lubrication.
4. Ensure that the winch truck is always in a reasonably level position. Use the outrigger supports when under any undue strain or questionable condition. Use sufficient foot-blocking under outrigger supports to distribute the load.
5. Never pass under a suspended load. Control the load by the use of sufficient guy lines.
6. When removing slings or chains caught beneath a load, stand well away to avoid the

snapback of such slings or chains.

7. Slings are recommended for raising loads rather than using the free end of the winch cable. Ensure that the load is equalized within a sling before raising. Remember the spreading of slings reduces the load that can be lifted safely.
8. Raise, lower, or adjust the center or side arms by the use of a center post and sheaf or other approved method rather than by manual lifting.
9. Avoid kinking of wire rope or cables, as it reduces strength and causes line to eventually break.

Chapter

6

TRAFFIC CONTROL

CONTROL OF TRAFFIC THROUGH WORK AREAS

The primary function of traffic control procedures is to move traffic safely and expeditiously through or around work areas. Herein are basic principles and prescribed standards to be followed in the design, application, installation and maintenance of all types of traffic control devices required for road maintenance and construction operations. These are the minimum standards for normal highway situations. Additional protection must be provided where special complexities and hazards exist, especially on high speed interstate highways. For situations not covered in this manual, refer to the Manual on Uniform Traffic Control Devices (MUTCD), as the guidelines contained in this manual are intended to comply with the MUTCD and Commission policies.

USE OF FLAGGERS

Flagging is provided at work sites to help protect the workers and traffic, either by stopping traffic intermittently as necessitated by work progress or maintaining continuous traffic flow past the work site at reduced speeds.

Qualifications for Flaggers

1. Flaggers must be trained in safe traffic control practices.
2. Ability to receive and communicate specific instructions clearly, firmly, and courteously.
3. Ability to move and maneuver quickly in order to avoid danger from errant vehicles
4. Ability to control signaling devices (such as paddles and flags) in order to provide clear and positive guidance to drivers approaching a TTC zone in frequently changing situations.
5. Ability to recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.

FUNCTIONS

Flaggers have the following basic, but important, functions:

1. Direct traffic through traffic control zones.
2. Protect the lives of workers, property, motorists and pedestrians.
3. Provide a safe separation between equipment operations and traffic movement.
4. Answer reasonable questions courteously and intelligently.

FLAGGING SITUATIONS

Flagging operations are most likely required in the following traffic control situations:

1. When one lane is alternately used for both directions of travel.
2. When the roadway is closed for a short period of time to accommodate equipment

movements, blasting operations, etc.

3. When personnel or equipment are working on the road (including shoulders) or where there will be actual motorist hazard within or adjacent to the roadway.
4. When traffic speeds need to be reduced and traffic control devices will not do it alone.
5. When public relations and publicity functions need to be handled at the work site, such as explaining the situation and alerting motorists to changing conditions.
6. When opposing traffic flows need to be controlled at an intersection.
7. When installing and removing traffic control devices.
8. Other situations where variable conditions require the exercise of judgment.

FLAGGING EQUIPMENT AND PROCEDURES

The use of a Department approved safety shirt/vest that meets the Performance Class 3 requirements of the ANSI/ISEA 107-2004 publication entitled "American National Standard for High-Visibility Apparel and Headwear" is required for flaggers. Flags should be limited to emergency situations and at spot locations, which can best be controlled by a single flagger. The flag should have the following characteristics:

1. Approximately 24" x 24" in size
2. Good grade material, red, attached to staff approximately three feet in length
3. Free edge should be weighted to ensure that flag will hang vertically, even in heavy winds

FLAGGING DEVICES

The sign paddle provides motorists with more positive guidance than flags and shall be the primary hand signaling device. The paddle should have the following characteristics:

1. Light semi-rigid material
2. 18 inches minimum
3. 6-inch minimum letters
4. Standard red octagonal STOP sign with white letters and border on one face
5. SLOW on orange diamond-shaped background with black letters/border on the other face
6. Attached to rigid handle

POSITIONING

Flaggers must be alert and clearly visible to approaching traffic at all times. Visibility must be sufficient to permit proper response by the motorist to the flagging instructions and to permit traffic to reduce its speed before entering the work site. The flagger's position in the traffic control zone must always be preceded by the "FLAGGER AHEAD" sign. This sign should be a minimum of 500 feet in advance of the flagger, on most occasions. **The sign should be promptly removed, covered or turned away from the roadway when the flagger is not stationed**. When the flagger is used, a "BE PREPARED TO STOP" sign may be added to the sign series. When used, the "BE PREPARED TO STOP" sign should be located before the flagger symbol sign. Signs must be picked up at the end of the day. The only exception should be during emergency procedures.

To perform duties properly, the flagger should:

1. Always be clearly visible to approaching motorists.
2. Never stand in the lane used by moving traffic.
3. Never stand among workers and equipment.
4. Stand sufficiently in advance of the work zone to warn employees of approaching danger.
5. Avoid blending in against a bright sky.
6. Provide adequate sight distance to lane closure to ensure safe and efficient traffic flow.

The flagger should be positioned as follows:

1. Stand on the shoulder adjacent to traffic, which is being controlled, in advance of a two-way traffic taper.
2. The flagger may move to a conspicuous position near the centerline after the first vehicle has been stopped in order to be readily seen by drivers approaching from the rear of the first car.
3. To control speed or equipment movement in and out of the work area, a flagger may stand in the barricaded lane.

Table 6E-1: Distance of Flagger Station in Advance of the Work Space (Stopping Sight Distance as a Function of Speed)

SPEED (mph)	DISTANCE (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

The distances shown in the above table may be increased for downgrades and other conditions that affect stopping distance.

FLAGGING PROCEDURES (FIGURE 6E-3)

The procedures to be used to stop traffic are:

1. When the paddle is used, face traffic and hold the paddle in a stationary position with the STOP side facing traffic. For added emphasis, the free arm should be raised with the palm toward approaching traffic.
2. When the flag is used, face traffic and extend the flag horizontally across the traffic lane in a stationary position. For added emphasis, the free arm should be raised with the palm toward approaching traffic.

When it is safe for traffic to proceed, the flagger should stand parallel to traffic movement and:

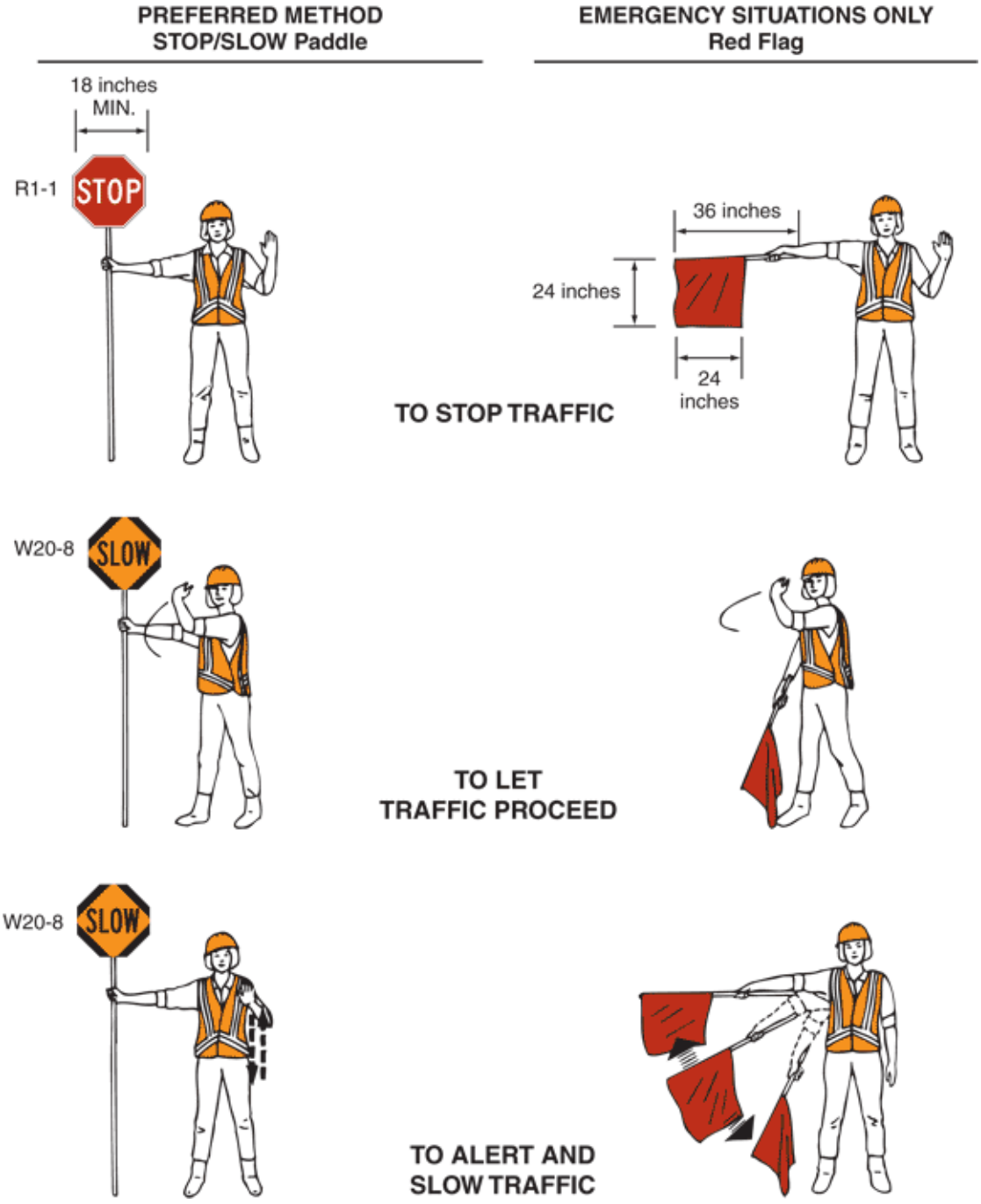
1. With the paddle, turn the SLOW face toward traffic and motion traffic ahead with the free arm.
2. With the flag, lower the arm holding the flag to the side of the body and motion traffic ahead with the free arm.

For added emphasis in slowing traffic, the flagger may slowly raise and lower the free hand with the palm down.

Night flagging should be avoided if possible. When necessary, flagging at night should be performed with the following additional items:

1. Retro-reflectorized flags/paddles or a red wand flashlight approved by the Department.
2. Lighting that illuminates the flagger's station, if possible.
3. Class 3 vest or ensemble required.

Figure 6E-3. Use of Hand-Signaling Devices by Flaggers



FLAGGER COORDINATION

When two or more flaggers are used to control traffic movements, one of the following methods may be used to coordinate assignment of right of way:

1. Visual Communication – clear verbal or hand signals may be used to communicate when flaggers can readily hear or see each other. Communication signals must be distinct from flagging signals. An intermediate flagger may be used to provide a visual link between flagging stations.
2. Pilot Vehicle – during a one-lane, two-way operation with the flagger on the opposite end not visible, a pilot vehicle may be used to escort vehicles through the work area. This method provides positive speed control and assures that traffic will travel where desired. The vehicle selected for pilot duty should have a **"Pilot Car"** sign mounted on the rear.
3. Portable Radios - effective means of providing communication between flaggers to ensure that traffic is only moving in one direction at one time. A description of the last vehicle in line can be easily given using the make, color and license number of that vehicle. If at any time during this type of operation a flagger is in doubt as to which direction has the right of way, all traffic should be stopped until the right of way is firmly established.
4. Flag Retrieval – another alternative is to give the last vehicle in line a flag, which is retrieved at the far end and sent back with the last vehicle of the returning group. Variations include magnetic bumper clips and/or an official vehicle following the last vehicle in line.

FLAGGER TRAINING

All flaggers must be trained prior to starting work in the field. Employees are required to take the online flagger/ course when hired. https://learning.ultipro.com/4696170/flagger

1. Supervisors **shall** have all new employees complete the Flagger training and quiz. Link to Quiz
2. Supervisors **shall** have all new employees complete the VSDO training and quiz.

Under normal conditions, flaggers should flag no longer than one-half of the regular work shift. During extreme temperatures and weather conditions, flaggers should flag no longer than two hours at a time. Exceptions may be made in unusual circumstances. ***Flaggers should not use a cell phone, portable/personal music player, or any other electronic device (except a communication radio) while flagging.***

SIGNING AND BARRICADING OF WORK AREAS

1. Advance signing should be used at any work site where workers and/or equipment will be on the road (including shoulders) or where there will be any actual motorist hazard within or adjacent to the roadway. All signs that are used during the hours of darkness should be retro-reflectorized or illuminated. All signs should be kept legible through adequate cleaning and maintenance.
2. Type I or Type II barricades are intended for use in situations where traffic is maintained through the area being constructed and/or reconstructed. They may be used alone or in groups to mark a specific hazard or they may be used in a series for channeling traffic. On high-speed expressways or in other situations where barricades may be susceptible to overturning in the wind, sandbags should be used for ballasting. Sandbags may be placed on lower parts of the frame or stays to provide the required ballast but should not be placed on top of any striped rail.

3. Flashing warning lights and/or flags may be used to call attention to the early warning signs. These flags should be kept clean and when they have lost their target value they should be discarded and replaced.
4. During temporary periods when signs are not needed, they should be removed, turned away from traffic, or their message covered. Where signs are to be left overnight, the supervisor or a person designated by the supervisor should inspect the signs to be left, ensuring that they are not subject to being blown over by passing vehicles during the time period when they are left unattended. No temporary signs should be left overnight unless in use.

ADVANCE WARNING ARROW PANEL

Advance warning arrow panels are sign panels with a matrix of lights capable of either flashing or sequential displays. Advance warning arrow panels are intended to supplement other traffic control devices. Arrow panels will not solve difficult traffic problems by themselves, but they can be very effective when properly used to reinforce signs, barricades, cones and other traffic control devices.

Arrow panels are effective in encouraging drivers to leave the closed lane sooner. Arrow panels provide additional advance warning and directional information where traffic must be shifted laterally along the roadway. They assist in diverting and controlling traffic around construction or maintenance activities being conducted on or adjacent to the roadway and give drivers positive guidance about a path diversion that they might not otherwise expect.

Arrow panels are generally used for lane closures, roadway diversions and slow-moving construction and maintenance activities on the roadway. They are particularly effective under high speed and high-density traffic conditions. At night, they are effective where other traffic control devices cannot provide adequate advance warning of a roadway path diversion. During daylight, arrow panels are effective under high-density traffic conditions that might block the driver's view of construction or maintenance activities ahead.

ADVANCE WARNING ARROW PANEL APPLICATION

Placement of the arrow panel should be varied as needed to achieve the desired recognition distances. Also, care must be taken in the placement to avoid driver confusion in the vicinity of ramps, median crossovers and side road intersections.

In diversions where arrow panel need has been determined, the arrow panel should be placed behind the barricades closing the roadway.

For stationary lane closures, the arrow panel should be placed on the shoulder at the beginning of the taper or where there are narrow shoulders in the closed lane behind the channeling devices on the same side of the lane closure. Placement at the start of the taper is preferred to placement in the middle of the taper.

For moving maintenance activities where a lane is closed, it is preferable that the arrow panel be placed at the rear of the activity in the closed lane on a vehicle separate from the maintenance vehicle itself. The arrow panel should always remain upstream of the maintenance vehicle where adequate recognition distance is available. The vehicle carrying the arrow panel should also be equipped with appropriate signing and/or lighting.

Generally, arrow panels should not be used for shoulder or roadside work activities nor should they be used on two-lane highways because the panels can cause unnecessary lane changing.

TYPICAL APPLICATIONS (TA)

Each temporary traffic control zone is different. Many variables such as location of work, road type, geometrics, vertical and horizontal alignment, intersections, interchanges, road user volumes, road vehicle mix (buses, trucks and cars) and road user speeds affect the needs of each zone. The typical applications (TAs) shown in the MUTCD include the use of various temporary control methods but do not include a layout for every conceivable work situation and should be altered when necessary to fit the conditions of a particular work zone. Other devices may be added to supplement the devices shown in the typical applications while others may be deleted. The sign spacing and taper lengths may be increased to provide additional time or space for driver response.

When applying typical applications and tables, refer and adhere to the Manual on Uniform Traffic Control Devices (MUTCD), Parts 1, 5 and 6.

Notes for Figure 6P-4—Typical Application 4
Short-Duration or Mobile Operation on a Shoulder

Guidance:

1. *In those situations where multiple work locations within a limited distance make it practicable to place stationary signs, the distance between the advance warning sign and the work should not exceed 5 miles.*
2. *In those situations where the distance between the advance signs and the work is 2 miles to 5 miles, a Supplemental Distance plaque should be used with the ROAD WORK AHEAD sign.*

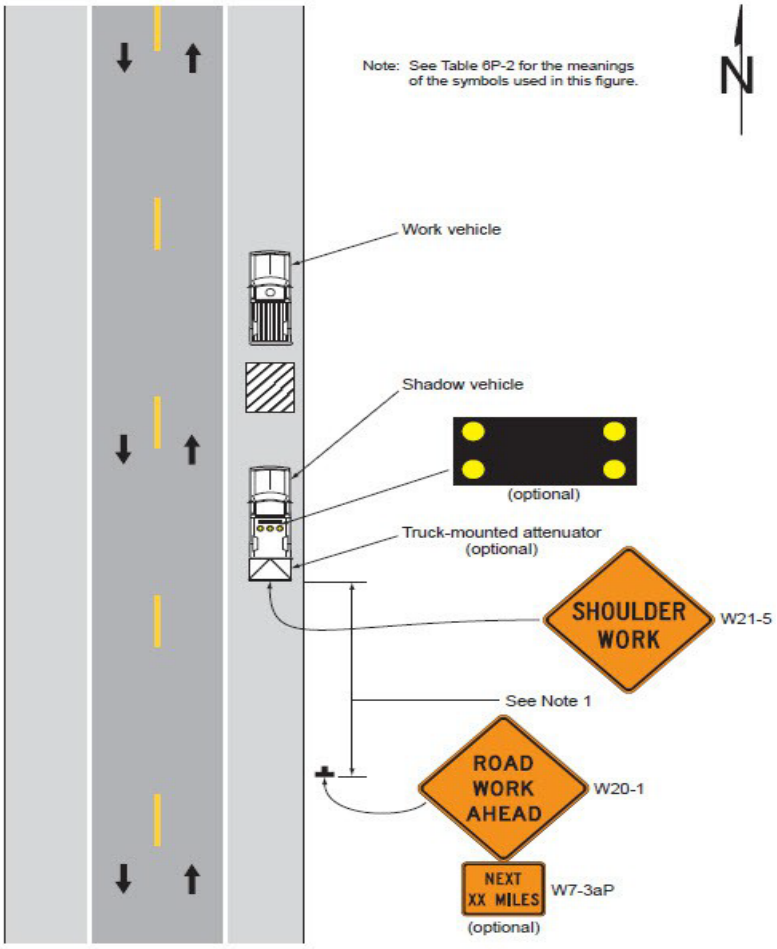
Option:

3. Additional positive protection devices may be used per Section 6M.02.
4. The ROAD WORK NEXT XX MILES sign may be used instead of the ROAD WORK AHEAD sign if the work locations occur over a distance of more than 2 miles.
5. Stationary warning signs may be omitted for short-duration or mobile operations if the work vehicle displays high-intensity rotating, flashing, oscillating, or strobe lights.
6. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

7. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**
8. **If an arrow board is used for an operation on the shoulder, the caution mode shall be used.**
9. **Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.**

Figure 6P-4. Short-Duration or Mobile Operation on a Shoulder (TA-4)



Typical Application 4

Notes for Figure 6P-6—Typical Application 6
Shoulder Work with Minor Encroachment

Guidance:

1. *All lanes should be a minimum of 10 feet in width as measured to the near face of the channelizing devices.*
2. *The treatment shown should be used on a minor road having low speeds. For higher-speed traffic conditions, a lane closure should be used.*

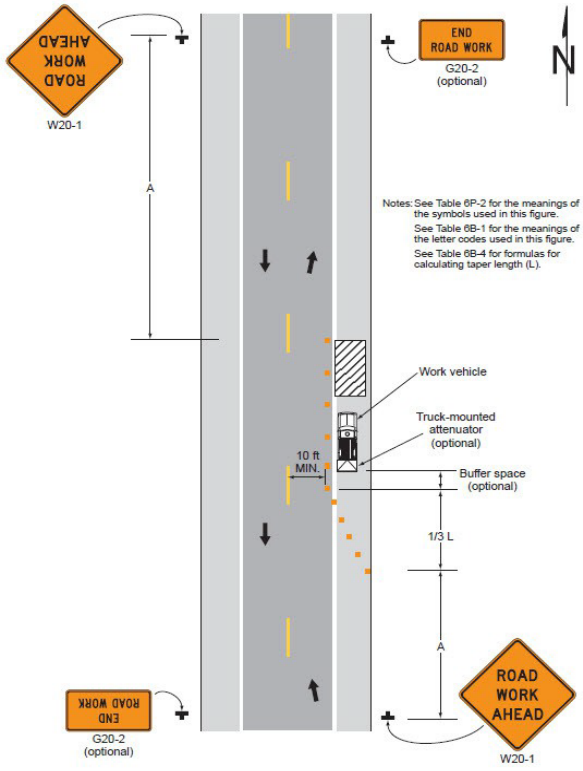
Option:

3. Additional positive protection devices may be used per Section 6M.02.
4. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 feet may be used.
5. Where the opposite shoulder is suitable for carrying vehicular traffic and of adequate width, lanes may be shifted by use of closely-spaced channelizing devices, provided that the minimum lane width of 10 feet is maintained.
6. Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
7. Temporary traffic barriers may be used along the work space.
8. The shadow vehicle may be omitted if a taper and channelizing devices are used.
9. A truck-mounted attenuator may be used on the shadow vehicle.
10. For short-duration work, the taper and channelizing devices may be omitted if a shadow vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
11. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

12. Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.
13. Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.
14. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

Figure 6P-6. Shoulder Work with Minor Encroachment (TA-6)



Typical Application 6

Notes for Figure 6P-10—Typical Application 10
Lane Closure on a Two-Lane Road Using Flaggers

Option:

1. Positive protection devices may be used per Section 6M.02.
2. For low-volume situations with short TTC zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6D).
3. The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short-duration operations.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs. A BE PREPARED TO STOP sign may be added to the sign series.
5. Automated Flagger Assistance Devices (see Section 6L.02) may be used in situations where there is only one lane of approaching traffic in the direction to be controlled.

Guidance:

6. *The buffer space should be extended so that the two-way traffic taper is placed before a horizontal (or crest vertical) curve to provide adequate sight distance for the flagger and a queue of stopped vehicles.*

Standard:

7. **At night, flagger stations shall be illuminated, except in emergencies.**

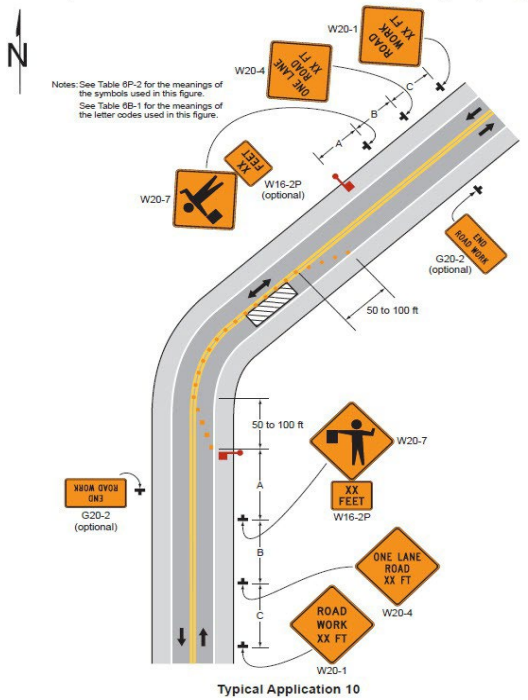
Guidance:

8. *When used, the BE PREPARED TO STOP sign should be located between the Flagger sign and the ONE LANE ROAD sign.*
9. *When a grade crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the grade crossing, the TTC zone should be extended so that the transition area precedes the grade crossing.*
10. *When a grade crossing equipped with active warning devices exists within the activity area, provisions should be made for keeping flaggers informed as to the activation status of these warning devices.*
11. *When a grade crossing exists within the activity area, drivers operating on the left-hand side of the normal center line should be provided with comparable warning devices as for drivers operating on the right-hand side of the normal center line.*
12. *Early coordination with the railroad company or transit agency should occur before work starts.*

Option:

13. A flagger or a uniformed law enforcement officer may be used at the grade crossing to minimize the probability that vehicles are stopped within 15 feet of the grade crossing, measured from both sides of the outside rails.

Figure 6P-10. Lane Closure on a Two-Lane Road Using Flaggers (TA-10)



Typical Application 10

Notes for Figure 6P-33—Typical Application 33
Stationary Lane Closure on a Divided Highway

Standard:

1. **This information also shall be used when work is being performed in the lane adjacent to the median on a divided highway. In this case, the LEFT LANE CLOSED signs and the corresponding Lane Ends signs shall be substituted.**
2. **When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed as needed.**

Guidance:

3. *When paved shoulders having a width of 8 feet or more are closed, channelizing devices should be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the traveled way.*

Option:

4. A truck-mounted attenuator may be used on the work vehicle and/or shadow vehicle.
5. Positive protection devices may be used per Section 6M.02.

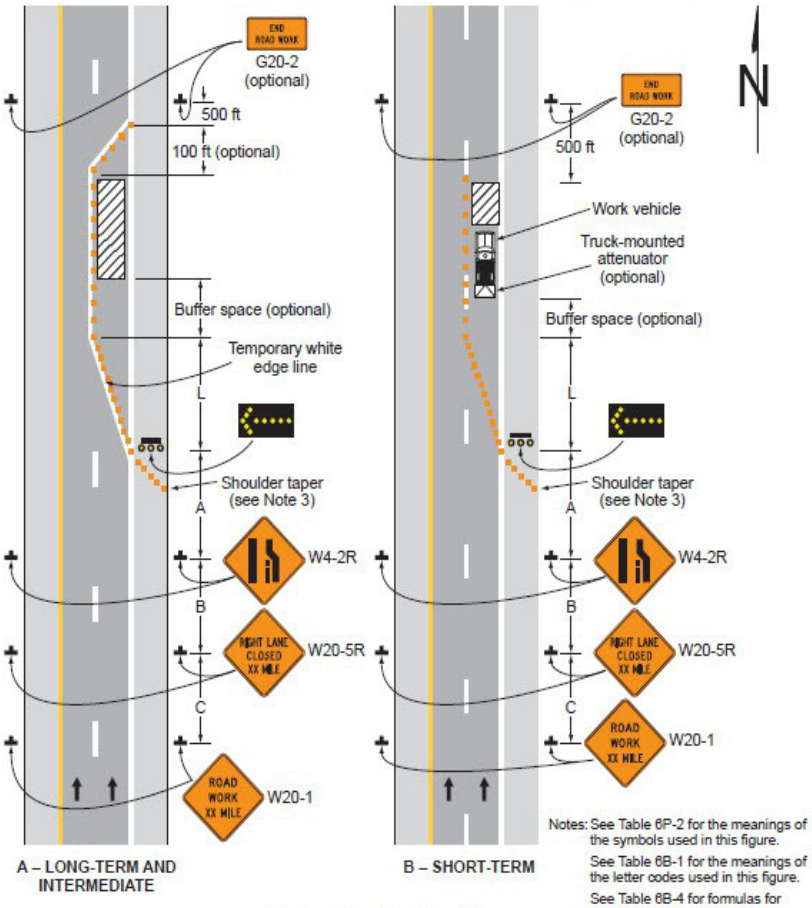
Support:

6. Where conditions permit, restricting all vehicles, equipment, workers, and their activities to one side of the roadway might be advantageous.

Standard:

7. **An arrow board shall be used when a freeway lane is closed. When more than one freeway lane is closed, a separate arrow board shall be used for each closed lane.**

Figure 6P-33. Stationary Lane Closure on a Divided Highway (TA-33)



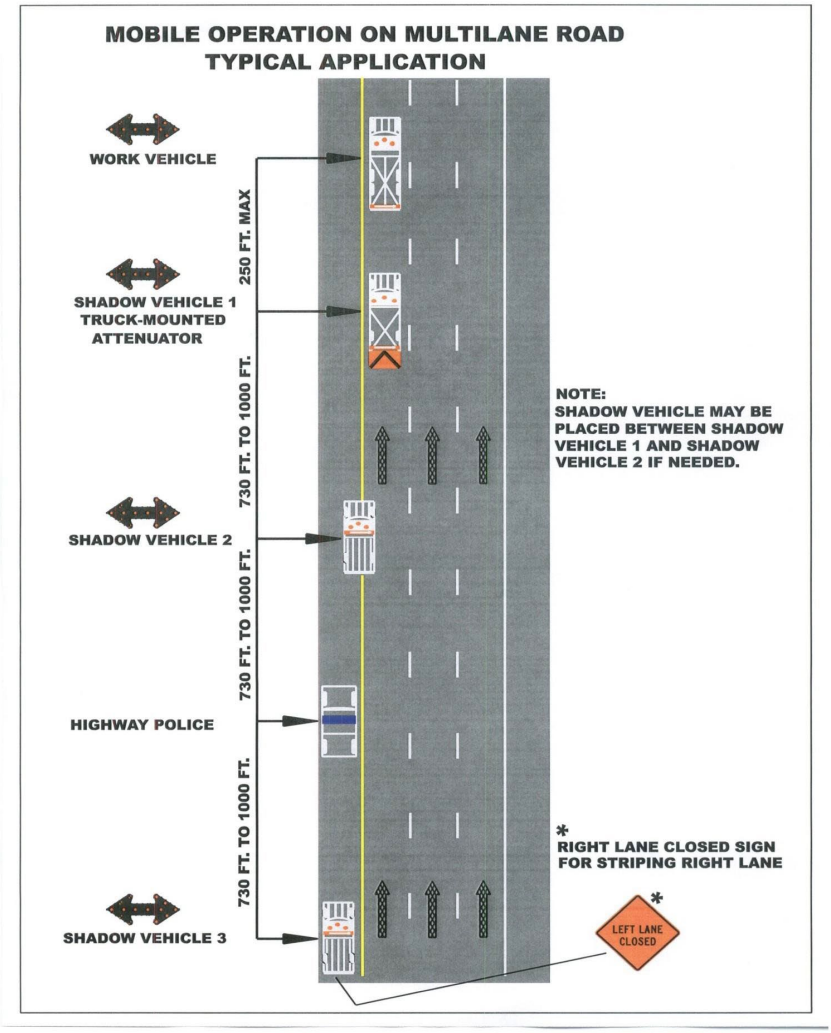
Typical Application 33

STRIPING CREWS

In an effort to provide better protection of employees, equipment and the traveling public, the following precautions are recommended when striping:

1. The striping machine should be equipped with a bar light on the cab and advance warning arrow panel on the rear.
2. The front escort truck should be equipped with one bar light which is mounted on the cab.
3. The rear escort truck should be equipped with one advance warning arrow panel on the rear and one revolving light on the cab.
4. Notice of wet paint is to be indicated on each vehicle.
5. On two-lane highways, both escort vehicles shall drive in the right traffic lane.
6. Divided highways should have a minimum of two rear escorts with the necessary safety devices.
7. When striping freeways, ask Arkansas Highway Police to escort when available.
8. A slow-moving vehicle emblem may be installed at the discretion of the State Maintenance Engineer or District Engineer.

❖ **See below Mobile Operation on Multilane Road Typical Application for additional guidance. Is intended to be used for striping and/or raised pavement marker operations.**



PARKING OF EQUIPMENT
All equipment should be parked as far as possible off the roadway surface and, when two or more pieces of equipment are being used, they should be parked on the same side of the highway whenever possible.

REMOVAL OF TRAFFIC CONTROL DEVICES
As soon as work is completed and traffic control devices are no longer needed, they should be removed. Remove the devices in the opposite order of installation by starting with the devices closest to the work area and continue away from the area. Use flashing arrow panels, high-level warning devices, flaggers or flashing vehicle lights to protect the workers who are removing the devices.

SEALING PROCEDURES
Traffic control is a must during sealing operations. The use of flaggers and a pilot vehicle is the best way to keep the traffic moving slowly through the work zone. The pilot truck should keep traffic under 20 mph. When the job is completed and two-way traffic is allowed, signs for 15 mph should be kept in place until the excess aggregate has been swept from the roadway.

SIGN CREWS
Due to the short duration of the work involved in installing a traffic sign, flaggers are required only where personnel or equipment blocks a portion of the road. Warning lights and traffic cones are required on all sign installation operations.

SNOW AND ICE REMOVAL
When equipment is in the process of removing snow or ice from the roadway surface, it shall be equipped with operational warning lights.

SPILLING LOADS ON HIGHWAYS PROHIBITED
The Arkansas Motor Vehicle and Traffic Laws and State Highway Commission Regulations state: No vehicle shall be driven or moved on any highway unless such vehicle is so constructed or loaded as to prevent any of its load from dropping, sifting, leaking or otherwise escaping there from, except that same may be dropped for the purpose of securing traction, or water or other substance may be sprinkled on a roadway in cleaning or maintaining such roadway. Additionally, trucks hauling sand, gravel, etc., are required to be tarped by Minute Order No. 93-155.

Very Short-Duration Operations Work Zone Procedure

I. Scope:

This procedure has been established to set guidelines for temporary traffic control in work zones of very short-duration, as they apply to ARDOT workers. Section 6G-2 of the Manual on Uniform Traffic Control Devices (MUTCD) and the ARDOT Safety Manual recognizes the need for safety in these operations. ARDOT defines Very Short-Duration Operation as **"The work activity takes no longer than five minutes in the roadway to complete at one specific location."**

Examples of Very Short-Duration operations include the following:

- Removal of debris or dead animal from the roadway
- Install or remove a work zone device
- Take a measurement or survey shot
- Guardrail inspection at a spot location

II. General Requirements:

A. The MUTCD and the ARDOT Safety Manual acknowledges that during short-duration work, it often takes longer to set up and remove the temporary traffic control zone than to perform the work. Workers face hazards in setting up and taking down the temporary traffic control zone. Also, since the work time is short, delays affecting road users are significantly increased when more devices than necessary are installed and removed. These factors are even more prevalent for very short- duration operations.

Considering these factors, simplified traffic control procedures MAY be warranted for very short-duration work of approximately 5 minutes or less in an open travel lane. A reduction in the number of devices may be offset by the use of other more prominent devices such as amber rotating, flashing, or strobe lights on work vehicles and the use of a temporary traffic control spotter to provide warning to workers in the roadway of approaching vehicles. Proper PPE shall always be worn in accordance with existing policies.

This procedure is intended to decrease the amount of time our workers are exposed to vehicular traffic at the worksite and therefore improve overall safety, not to make the job easier or quicker at the expense of safety**. If at any time an employee does not feel safe entering the roadway to perform these procedures, then the appropriate temporary traffic control devices should be deployed.**

B. **Minimum criteria** to use the very short-duration method:

1. Whenever possible and available, vehicles should be parked completely on the shoulder and out of the travel lane(s) unless otherwise noted in this procedure.

2. The work activity will take approximately five (5) minutes or less to complete. If the magnitude or scope of the work has changed such that it will significantly exceed the five-minute timeframe, then the work zone should be converted to a mobile operation. If it is uncertain if the work will take five minutes or less, use traffic control required for a mobile operation or appropriate temporary traffic control (TTC).

3. On **High-Speed roadways (65 MPH and greater) and on moderate to high volume roadways,** a temporary traffic control spotter (a person other than the one doing the work) **shall be used** to keep an eye on traffic w hen performing operations. The temporary traffic control spotter cannot direct or 'flag" traffic because flagging requires proper advanced warning signage and the use of a STOP/SLOW paddle. . Temporary traffic control spotters **shall** always face traffic and not use cell phones, electronic devices, or be distracted while performing this task.

4. Traffic volume must be low enough to provide adequate gaps to safely perform the task. Traffic volume can be defined as follows:

Definitions of Traffic Volume for Very Short-Duration Operations	
Low Volume	1-4 vehicles per lane per minute
Moderate Volume	5-9 vehicles per lane per minute
High Volume	10+ vehicles per lane per minute

5. **When High-Speed and High-Volume traffic exists, workers shall not enter or cross a live lane of traffic for any reason.** Very short duration work can only be performed from the shoulder in this case.

6. To the extent possible, workers should face traffic while performing very short-duration maintenance operations.

7. This application requires good judgement since each temporary traffic control zone location is different. Many variables, such as location of work, road type, geometrics, vertical and horizontal alignment, sight distance, intersections, interchanges, traffic volumes, vehicle mix (trucks, buses, and cars), and speed of traffic affects the needs of each work zone. The goal of every temporary traffic control zone is safety with minimal disruption to road users.

8. All employees who perform temporary traffic control operations **shall** be trained on the contents of this procedure.

III. Applications:

The following Temporary Traffic Control figure has been developed for Very Short- Duration operations.

A. **Figure TTC-1, Very Short-Duration Operation within the Travel Lane(s) of a Multi-lane Roadway** – for operations where the work vehicle can safely park on the shoulder to perform the very short-duration activity either on the shoulder or in the adjacent travel lane on a multi-lane roadway.

Very Short-Duration Operation Requirements

These requirements cover activities where the work vehicle is parked fully on the shoulder of the roadway, but the work activity may occur in the adjacent open travel lane:

1. Vehicle(s) shall have rotating, flashing, or strobe lights visible for 360º.
2. The work vehicle should be placed on the shoulder to act as a shield, with the activity being performed downstream of the work vehicle whenever possible.
3. A temporary traffic control spotter:

   Shall be used for:
   - High-Speed (65 MPH and greater) roadways when the activity takes place on the shoulder or in an open travel lane(s).
   - Moderate to high traffic volume roadways when the activity takes place on the shoulder or in an open travel lane(s).
   - When using a tool to remove object from adjacent travel lane(s) while remaining on shoulder.

   Should be used for:
   - Low speed and low traffic volume roadways when the activity takes place in an open travel lane(s) and adequate sight distance.

4. Workers performing very-short duration operations in the travel lane(s) at night **shall** wear ASNI/ISEA 107-2010 Performance Class 3 ensemble which includes:
   - Class E trousers or high-visibility leg gaiters and personal safety light.
5. Only when an adequate gap occurs in traffic, the worker(s) **shall walk** from the nearest shoulder, and *not run*, to perform the operation in an adjacent open lane. If a gap in traffic is so short that it appears to be necessary to run to perform the operation, then the traffic volume was probably misjudged, and it is unsafe to use this procedure. If an adequate gap does not occur due to traffic volumes or limited sight distance due to hills or curves, then the work zone should be converted to a short duration or mobile operation with the appropriate TTC.
6. **When High-Speed and High-Volume traffic exists, workers shall not enter or cross a live lane of traffic for any reason. Work can only be performed from the shoulder.**

Supervisors shall have all new employees complete the VSDO Quiz before working on the roadway.

Typical Traffic Control
Very Short-Duration Operation within the Travel Lane(s) of a Multi- Lane Roadway
(Figure TTC-1)

NOTES

Standard:

1. **Vehicle(s) shall have rotating, flashing, or strobe lights visible from 360º.**

Guidance:

2. *The work vehicle should be placed on the shoulder in advance of the hazard or work operation to act as a shield to the worker(s), with the activity being performed downstream of the work vehicle whenever possible.*

Standard:

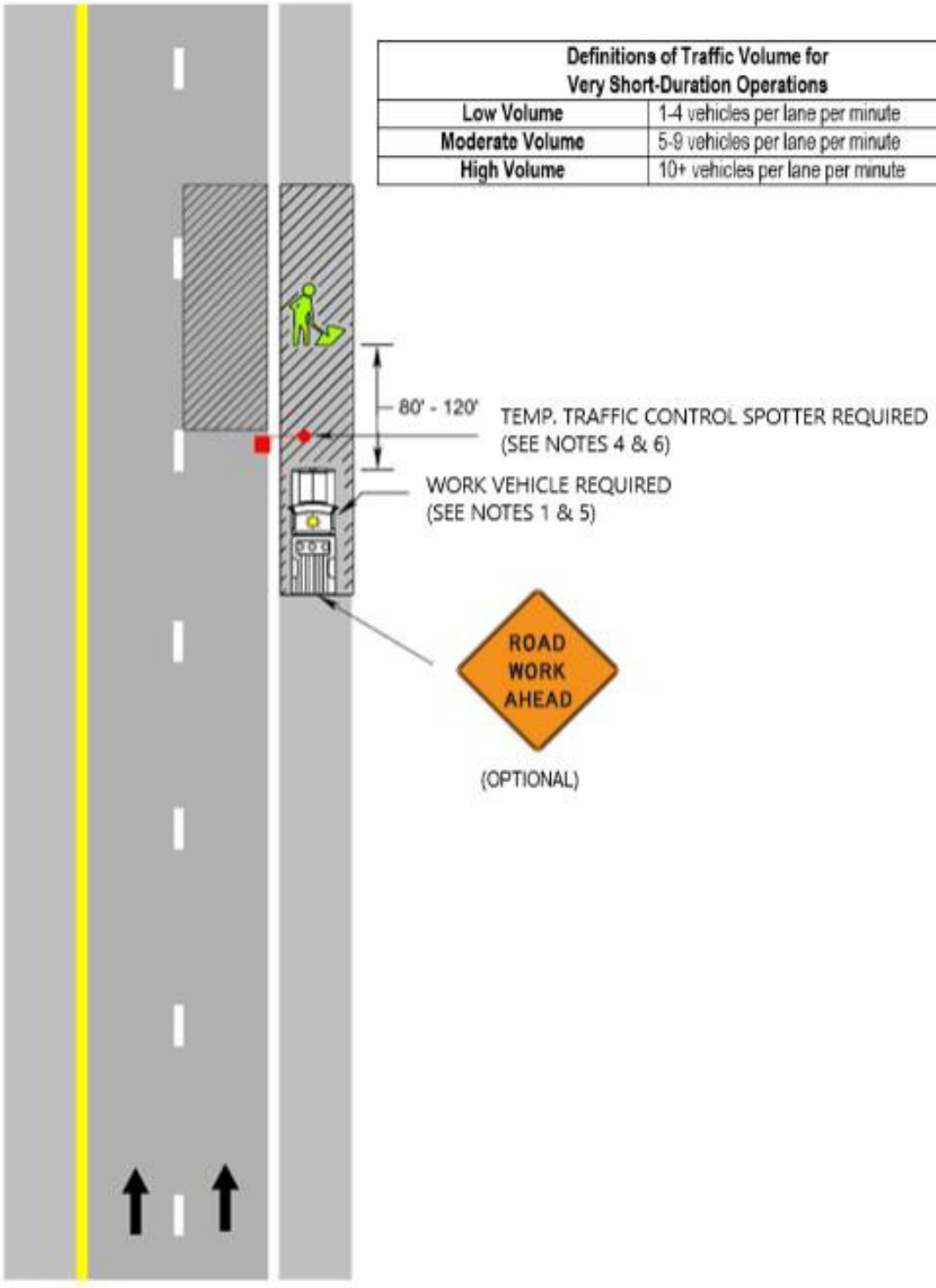
3. **Employees shall not enter the open travel lane(s) on roadways that are both high-speed and high-volume.**
4. **A Temporary Traffic Control (TTC) Spotter shall be used for high-speed roadways or moderate to high traffic volume roadways when a worker must enter a live lane of traffic, or at locations with reduced sight distance.**

Guidance:

5. *The TTC Spotter should be protected by the work vehicle whenever possible. The sole function of the TTC spotter is to warn of approaching vehicles.*
6. *A TTC Spotter should also be used when the activity takes place in an open travel lane(s) on low traffic volumes and speeds less than 65 MPH.*

Standard:

7. **Workers performing very-short duration maintenance operations in the travel lane(s) at night shall wear ASNI/ISEA 107-2010 Performance Class 3 ensemble which includes, Class E trousers or high-visibility leg gaiters and personal safety light.**



Very Short Duration Operation within the Travel Lane(s) of a Multi-Lane Roadway
(Figure TTC-1)

Mobile Work Zone Operation Procedures

I. Scope:

This procedure has been established to set guidelines for temporary traffic control in mobile work zones. Section 6N.01 of the Manual on Uniform Traffic Control Devices (MUTCD) and the ARDOT Safety Manual recognizes the need for safety in these operations. ARDOT defines Mobile Lane Closures as **"Lane closures associated with short-duration work that moves continuously or intermittently along the roadway, in which the work activity takes no longer than fifteen minutes to complete at one specific location."**

Examples of work for which Mobile Lane Closures may be used include, but are not limited to the following:

- Litter cleanup
- Pothole patching
- Line painting
- Vegetation spraying
- Installation and removal of static work zone traffic controls
- Sign Repair and Installation

II. General Requirements:

1. Mobile operations shall have appropriate devices on the equipment (that is, high intensity rotating, flashing, oscillating, or strobe lights, signs, or special lighting), or shall use a separate vehicle with appropriate warning devices. Although vehicle hazard warning lights are permitted to be used to supplement high intensity rotating, flashing, oscillating, or strobe lights, they shall not be used instead of these devices.
2. When mobile operations are being performed, a shadow vehicle equipped with an arrow board or a sign **shall** follow the work vehicle, unless described otherwise in the below applications. Where feasible, warning signs should be placed along the roadway and moved periodically as work progresses.
3. Avoid high-volume conditions - consideration should be given to scheduling mobile operations work during off-peak hours.
4. Arrow boards and truck-mounted attenuator(s) **shall** be used for mobile operations on ~~a~~ multi-lane highways with speeds greater than 45 MPH.

III. Applications:

The following Temporary Traffic Control figures have been developed for Mobile Lane Closures on Two-Lane Roads and Multi-Lane Roadways.

1. **Figure TTC-1, Mobile Lane Closure Operations on a Two-Lane Road** – for mobile and short duration operations along two-lane roadways. (See MUTCD TA-17 for additional guidance)

2. **Figure TTC-2, Mobile Lane Closure Operations on a Multi-Lane Road** – for mobile and short duration operations along multi-lane roadways. (See MUTCD TA-35 for additional guidance)

Note: For Mobile Lane Closure Operations on Shoulders use MUTCD TA-4.

Notes for Figure TTC-1
Mobile Lane Closure Operations on a Two-Lane Road

Standard:

1. **Shadow vehicle is required for this operation, unless described otherwise in below Guidance.**
2. **Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.**
3. **Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.**
4. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**
5. **If an arrow board is used, it shall be used in the caution mode.**

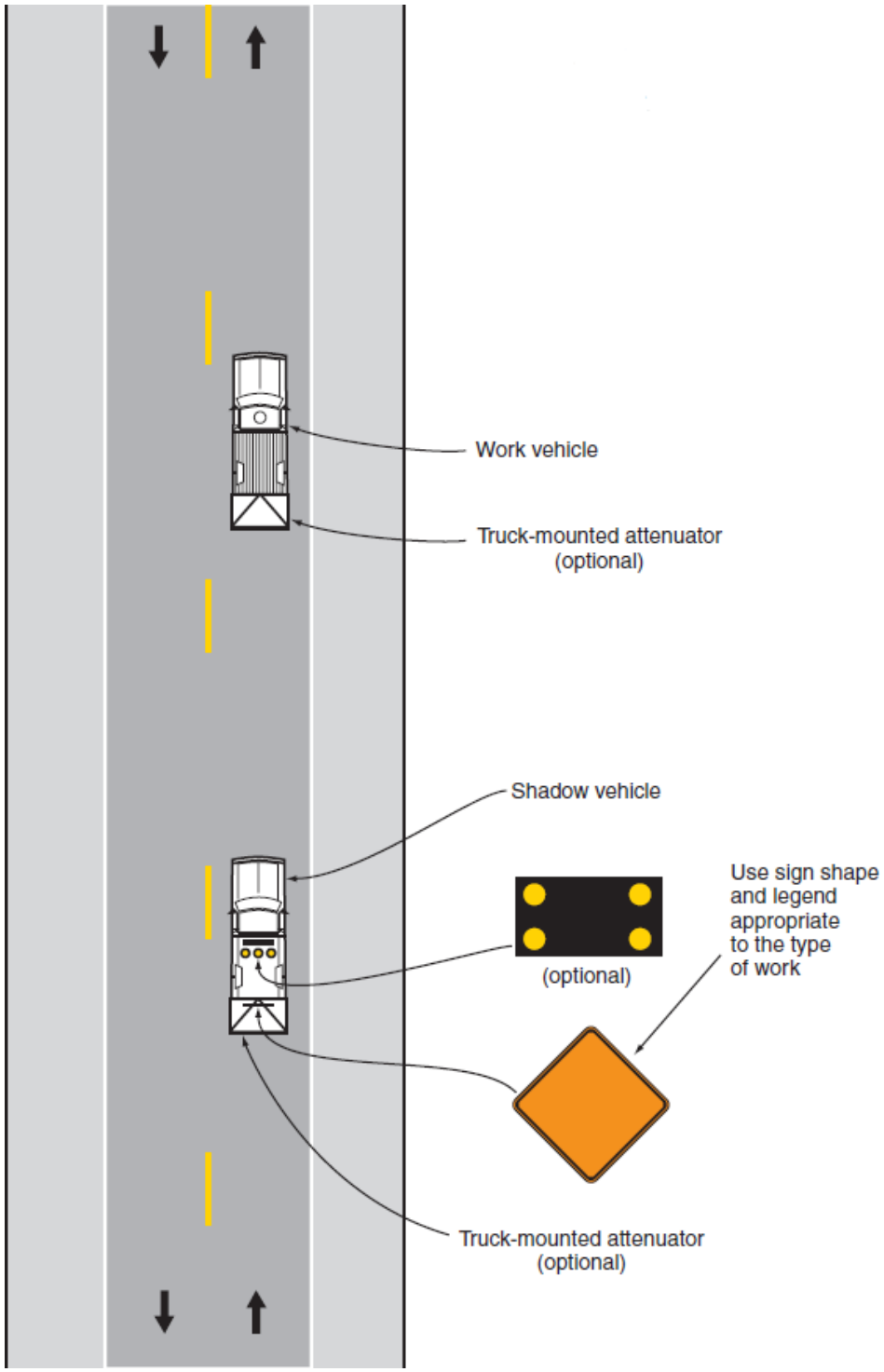
Guidance:

6. *Where practical and when needed, the work and shadow vehicles should pull over periodically to allow vehicular traffic to pass.*
7. *Whenever adequate stopping sight distance exists to the rear, the shadow vehicle should maintain the minimum distance from the work vehicle and proceed at the same speed. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.*
8. *The shadow vehicles should also be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.*
9. *For operations that do not stop in the travel lane, and workers are not outside the work vehicle, such as moving vegetation spraying, a shadow vehicle is not required, provided the work vehicle displays appropriate signage on rear of vehicle.*

Option:

10. The distance between the work and shadow vehicles may vary according to terrain, paint drying time, and other factors.
11. Additional shadow vehicles to warn and reduce the speed of oncoming or opposing vehicular traffic may be used. Law enforcement vehicles may be used for this purpose.
12. A truck-mounted attenuator may be used on the shadow vehicle or on the work vehicle.
13. If the work and shadow vehicles cannot pull over to allow vehicular traffic to pass frequently, a DO NOT PASS sign may be placed on the rear of the vehicle blocking the lane.

Figure TTC-1
Mobile Lane Closure Operations on a Two-Lane Road



Notes for Figure TTC-2

Mobile Lane Closure Operations on a Multi-Lane Road

Standard:

1. **Shadow vehicles are required for this operation.**
2. **Shadow Vehicle 1 shall be equipped with an arrow board and truck-mounted attenuator.**
3. **Shadow Vehicle 2 shall be equipped with an arrow board.**
4. **Arrow boards shall, as a minimum, be Type B, with a size of 60 x 30 inches.**
5. **Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.**
6. **Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.**
7. **An arrow board shall be used when a freeway lane is closed. When more than one freeway lane is closed, a separate arrow board shall be used for each closed lane.**

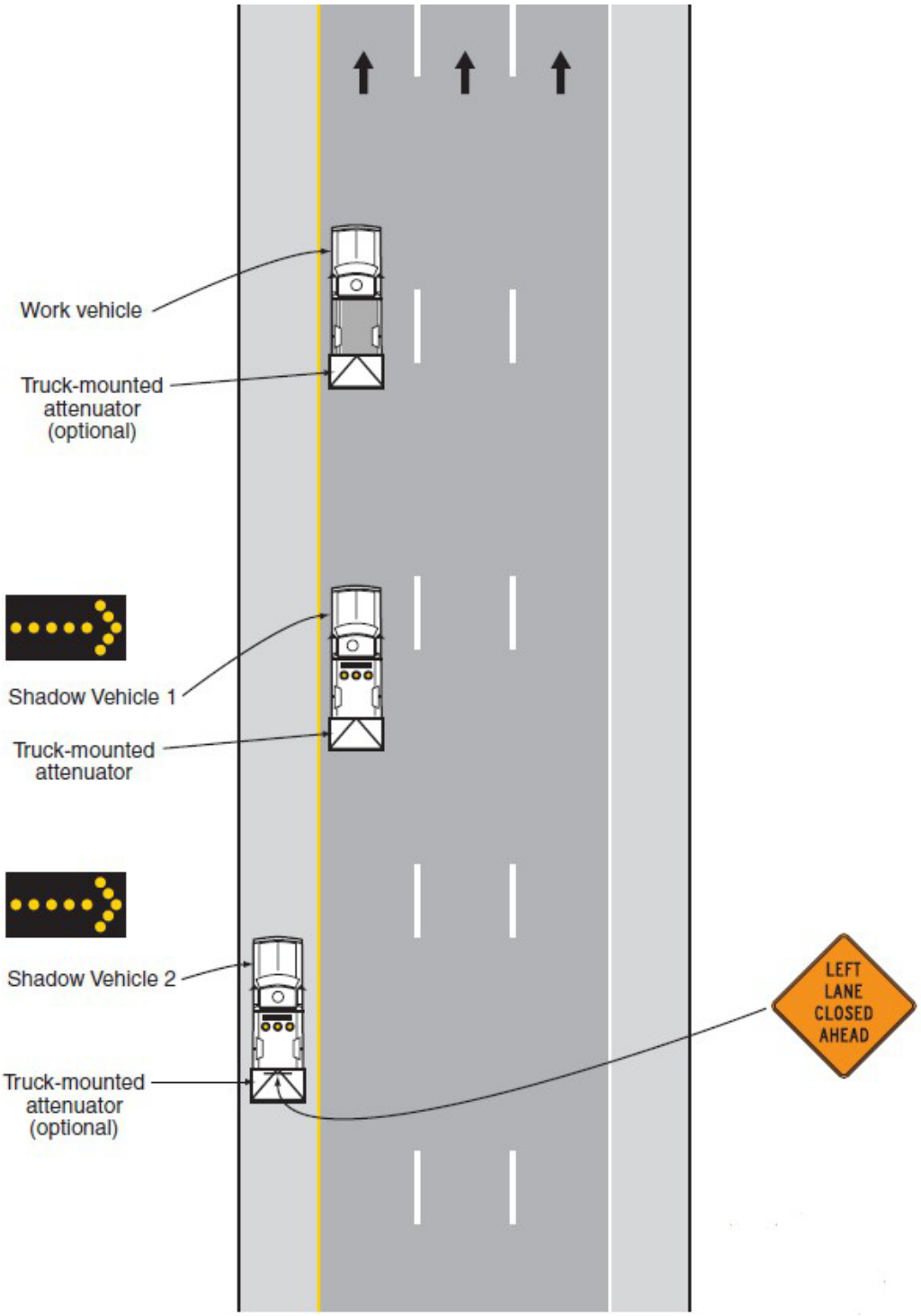
Guidance:

8. *Vehicles used for these operations should be made highly visible with appropriate equipment, such as flags, signs, or arrow boards.*
9. *An appropriate lane closure sign should be placed on Shadow Vehicle 2 so as not to obscure the arrow board.*
10. *Shadow Vehicle 2 should travel at a varying distance from the work operation so as to provide adequate sight distance for vehicular traffic approaching from the rear.*
11. *The spacing between the work vehicles and the shadow vehicles, and between each shadow vehicle, should be minimized to deter road users from driving in between.*
12. *Work should normally be accomplished during off-peak hours.*
13. *When the work vehicle occupies an interior lane (a lane other than the far right or far left) of a directional roadway having a right-hand shoulder 10 feet or more in width, Shadow Vehicle 2 should drive on the right-hand shoulder with a sign indicating that work is taking place in the interior lane.*

Option:

14. A truck-mounted attenuator may be used on Shadow Vehicle 2.
15. On high-speed roadways, a third shadow vehicle (not shown) may be used with Shadow Vehicle 1 in the closed lane, Shadow Vehicle 2 straddling the edge line, and Shadow Vehicle 3 on the shoulder.
16. Where adequate shoulder width is not available, Shadow Vehicle 3 may also straddle the edge line.

Figure TTC-2
Mobile Lane Closure Operations on a Multi-Lane Road



Lane Closure Setup and Removal Procedures

I. Scope:

These procedures have been established to set guidelines for the installation and removal of temporary traffic control (TTC) devices for work zones. See Section 6P.01 of the Manual on Uniform Traffic Control Devices (MUTCD) for Typical Applications TA-10 and TA-33 for further information.

The ARDOT Safety Manual prohibits all personnel from being allowed to ride anywhere other than the cab of any vehicle in motion, unless the vehicle is designed to accommodate an individual(s) outside the cab. Only vehicles equipped with a District/Division approved personnel cage or basket, mounted to the rear of the truck by either a permanent installation or a removable receiver-mounted installation, may be utilized to transport personnel installing or removing TTC devices when the vehicle is in motion. In addition, a TTC trailer may be utilized to transport personnel to install and remove TTC devices, only if equipped with District/Division approved siderails to help prevent workers from falling from the trailer while in motion.

General Requirements:
The below procedures provide minimum requirements for typical applications yet cannot cover all possible scenarios. Other methods of installation or removal shall receive prior approval from the District/Division.

Two-lane Roadway (MUTCD TA-10)
When the work vehicle must occupy any portion of a lane, a shadow vehicle equipped with warning sign and appropriate flashing lights **should** be used to protect the workers and work vehicle during the installation and removal of temporary work zones.

Temporary traffic control signals or Automated Flagger Assistance Devices (AFAD) may be used on two-lane roadways in lieu of traditional flaggers in the below described procedures, per Section 6L.01 and Section 6L.02 of the MUTCD.

Lane Closure Installation Procedures:

Stationary lane closures on a two-lane roadway **shall** be installed with the flow of traffic in the following sequence:

1. Install advance warning signs on each end of work zone with a mobile operation.
2. Position both flaggers. Flagger 1 shall stop traffic for the closed lane.
3. Install flagging taper channelizing devices by walking.
4. Continue placing centerline channelizing devices in a forward motion. Workers may

deploy centerline devices from a District/Division approved personnel cage or basket mounted to the rear of the work vehicle, TTC device trailer, or by walking.

5. Review lane closure by performing drive through inspection and correct any deficiencies.

Lane Closure Removal Procedures:

All TTC devices on a two-lane roadway shall be removed in the following sequence:

1. With **both flaggers stopping traffic**, remove centerline channelizing devices.
   a. Workers may either work from a District/Division approved personnel cage or basket mounted to the rear of the work vehicle, TTC device trailer, or by walking behind vehicle, to remove channelizing devices at the centerline.
   b. The work vehicle **shall not** drive in reverse direction.
2. Remove flagging taper devices by walking.
3. Flaggers release traffic.
4. Remove advance warning signs with a mobile operation.

Multi-Lane Roadway (MUTCD TA-33)

The use of Highway Police (blue lights) is recommended with any mobile or stationary lane closure on a multi-lane divided highway. A shadow vehicle with flashing arrow **shall** follow the work vehicle during the installation and removal of merging taper channelizing devices. On highways with posted speeds >45 mph, a truck-mounted or trailer-mounted attenuator is **required** on the shadow vehicle.

Lane Closure Installation Procedures:

Stationary lane closures on a multi-lane roadway **shall** be installed with the flow of traffic in the following sequence:

1. Install advanced warning signs, then install arrow board on shoulder (or behind curb) near shoulder taper. If roadway has a full shoulder that the work vehicle can occupy, shadow vehicle is not required to install advance warning signs.
2. Install shoulder/lane merging taper channelizing devices by walking ahead of shadow vehicle blocking lane.
3. Relocate shadow vehicle inside closed lane and continue placing lane channelizing devices along the buffer and workspace with workers **always protected** by a shadow vehicle. Workers may deploy lane channelizing devices from a District/Division approved personnel cage or basket mounted to the rear of the work vehicle, TTC device trailer, or by walking.
4. Review lane closure by performing drive through inspection and correct any deficiencies.

Lane Closure Removal Procedures:

All TTC devices on a multi-lane roadway, shall be removed using one of the following options:

Option A: *(Reverse order, Forward driving):*

1. Work vehicle shall maneuver (turn around) to face against the flow of traffic and be located in the closed lane.
2. Begin removing channelizing devices with the work vehicle advancing in a forward motion starting from the end of the activity area working back to the widest part of the merging

taper.

a. Workers may either work from a District/Division approved personnel cage or basket mounted to the rear of the work vehicle, TTC trailer, or walking behind vehicle, to remove channelizing devices at the lane line or centerline.

3. Before removing merging taper, the work vehicle shall maneuver (turn around) to face the flow of traffic, while the shadow vehicle positions ahead of the merging taper and arrow board.
4. With shadow vehicle blocking lane, remove merging taper devices by walking, then remove flashing arrow.
5. Remove advance warning signs with mobile operations/shadow vehicle. If roadway has a full shoulder that the work vehicle can occupy, shadow vehicle is not required to remove advance warning signs.

Option B: *(Reverse order, Reverse driving):*

In the event that the work vehicle physically cannot turn around in the work zone to initiate removal, the work vehicle may operate in reverse, **only** if personnel remain in front of the work vehicle while in motion or equipped with a District/Division approved personnel cage or basket mounted to the rear of the truck.

1. Beginning at the end of the closed lane, work vehicle operates slowly in reverse, with worker in truck mounted cage/basket removing lane devices, or walking in front of vehicle.
   a. Workers **shall not walk behind** the vehicle while it is moving in reverse.
   b. The driver of the work vehicle must maintain constant visual sight of all workers within the personnel cage/basket. It is critical that visual obstructions are removed from the bed of the vehicle that may hinder the driver's sight of workers.
2. Position shadow vehicle ahead of the merging taper and arrow board.
3. With shadow vehicle blocking lane, remove merging taper devices by walking, then remove flashing arrow.
4. Remove advance warning signs with mobile operations/shadow vehicle. If the roadway has a full shoulder that the work vehicle can occupy, a shadow vehicle is not required to remove advance warning signs.

Option C: *(Forward Order, Multi-Lane Mobile Operation):*

If at least two shadow vehicles with arrows are available, then the lane closure can be removed in forward order as a Mobile Lane Closure Operation per MUTCD TA-35.

1. Position shadow vehicles with flashing arrows in advance of the merging taper in accordance with a Mobile Lane Closure Operation per MUTCD TA-35.
2. Remove flashing arrow, then remove merging taper devices by walking in forward direction.
3. With shadow vehicles following workers and work vehicle(s), proceed with removing lane channelizing devices with workers **always protected** by the shadow vehicle mobile operation. Workers may remove lane channelizing devices from a District/Division approved personnel cage or basket mounted to the rear of the work vehicle, TTC device trailer, or by walking.
4. Remove advance warning signs with mobile operations/shadow vehicle. If the roadway has a full shoulder that the work vehicle can occupy, a shadow vehicle is not required to remove advance warning signs.

Chapter

7

CHEMICAL MOWING

SPRAYING

1. Employees coming into contact with spray materials should have a thorough knowledge of the chemicals being used and be certified by the University of Arkansas Cooperative Extension Service.
2. The operation and maintenance of the spray power equipment is the responsibility of an employee who is well-versed in its operational functions.
3. Surfaces on the spray tank and truck should be kept reasonably free from accumulation of spray material by washing frequently.
4. Material Safety Data Sheets (MSDS) should be readily available when spraying.

PESTICIDES AND CHEMICAL SPRAYS

1. Follow the manufacturer's directions and precautions printed on the container.
2. Do not use pesticides and chemical sprays near open flame. Do not smoke during use.
3. When it is known or when there is a question regarding the toxicity of a material, protective devices such as gloves, goggles, safety glasses, etc., should be used.
4. Do not allow pesticides and chemical sprays to come into contact with the skin.

WEED KILLERS

1. Follow instructions on the container.
2. Wear a face shield when applying and mixing weed killers.
3. In case of exposure, immediately flush skin and eyes with water for at least 15 minutes.
4. Get medical attention for any significant exposure, especially to the eyes.
5. Wear protective gloves and long-sleeved shirts when handling weed killers.
6. When working in areas where weed killers are being applied, stand upwind to avoid spray.
7. Do not mix "Roundup" in a galvanized container, as a combustible mixture can result.

TRAFFIC CONTROL

1. Keep the vehicle as far off the driving surface as possible.
2. Ensure that trail or shadow vehicles are equipped with flashing revolving lights that are visible from both sides.

Chapter

8

FIELD CONSTRUCTION ACTIVITIES

GENERAL INFORMATION

In the event that an employee is subjected to hazards which are not covered by this manual, the Manual on Uniform Traffic Control Devices (MUTCD), the Standard Specifications for Highway Construction manual, and/or the contractor's safety requirements on the project will apply.

Personnel assigned to supervise or inspect the work of a contractor should insist on following project specification requirements which pertain to safety. The term "contractor" shall mean any person, firm, corporation or authority, whether private or public, engaged or employed by another to perform work.

Personnel should keep themselves and their equipment either clear of or properly protected from the operations of the contractor. Personnel are not required to inspect any work until adequate protection has been furnished.

PERSONNEL HAZARDS

Always remove the plumb-bob when carrying an instrument and do not attempt to climb a fence or other obstruction with the instrument over the shoulder or in the arms.

When working in the vicinity of high-tension wires, extreme caution should be taken to prevent contact with any survey equipment. Use nonconductive rods whenever possible. Do not throw a survey chain with electrical wires or constitute a hazard to traffic or other workers.

Use life jackets and/or safety lines when working over streams and on bridges.

The proper use and care of brush cutting tools cannot be overemphasized. Keep tool edges sharp. Adopt a correct stance to keep the legs out of the way. As a further precaution, chop small vines and brush that could change the direction of a powerful stroke first.

SURVEY CREW SAFETY

Due to the varied and unique functions performed by the members of a survey crew, it is extremely difficult to establish fixed safety practices to minimize risks when survey work is being performed on the roadway. However, when working on the travel lanes, proper traffic control should be used.

Exceptions to the use of this traffic control are as follows:

1. When the survey crew is surveying in a construction or maintenance zone that is posted and signed in accordance with the Safety Manual or contract specifications.

2. When the majority of the survey work is being performed off the roadway and only infrequent measurements or readings are being taken by members of the crew on the travel lanes.

The Survey Crew Chief, when implementing the above exceptions, should use good judgment in establishing a level of safety to adequately protect survey party members and the traveling public.

The above exceptions DO NOT alleviate the requirements that all party members working on the roadway must wear Department issue vests. A flagger should be used when a surveys' technician is working on the travel lanes and survey crew signs should be posted and kept within reasonable limits of the work zone.

WEARING OF HARD HATS BY CONSTRUCTION EMPLOYEES

In the interest of statewide uniformity, the following is the hard hat policy for the Construction and Maintenance Divisions. It is the responsibility of the Resident Engineers to see that all employees are advised that hard hats are to be worn when working at the following work sites:

1. Culvert and bridge construction where overhead operations are in progress.
2. Direct contact with rock crushers and screening plants.
3. Direct contact with hot mix asphalt plants.
4. Official Hard Hat Areas.
5. Other locations where there is a danger of head injury.

It is the ultimate responsibility of each employee to wear the hard hat in applicable areas in compliance with this policy.

NOISE, DUST AND CHEMICAL HAZARDS

Noise and dust exposure can be alleviated easily by the use of ear protection, dust masks or respirators. Protection from hazardous chemicals is provided in the form of gloves, goggles or safety glasses, and respirators. Biodegradable solvents are supplied to field laboratories for the asphalt extraction process.

SKIN CONTACT

Polyvinyl alcohol or neoprene gloves are provided (neoprene is the most practical choice).

EYE PROTECTION

Goggles or safety glasses are provided for use while pouring and stirring chemicals.

STORAGE OF BIODEGRADABLE SOLVENTS

Indoors, drums should be stored in a cool place bung up. Outdoors, horizontal racking is preferred because of the possibility that water may be sucked in through the bung of a standing drum. Bungs should be kept tight at all times. Ventilation should be provided at the floor level as well as in the usual higher locations, since the vapor is heavier than air. Do not store in pits, depressions, basements or unventilated areas.

DISPOSAL OF BIODEGRADABLE SOLVENTS

These solvents do not produce a hazardous waste residue. Dispose of the solvent/asphalt cement extraction residue by pouring it on the working face of the coarse aggregate stockpile or the cold feeds and processing through the asphalt in the course of normal operations.

FLAMMABLES

Most of the biodegradable solvents have a relatively low flash/burn temperature (140 to 200 degrees Fahrenheit). Use caution if around open flames. Rags used in cleanup can be very susceptible to spontaneous combustion and should be stored in approved safety cans or a safe location.

NUCLEAR DENSITY GAUGES

The use of nuclear moisture density gauges by Department personnel is controlled by a license granted by the Arkansas Department of Health. The license places certain restrictions on the use and handling of the gauges for protection and safety of both the user and other personnel near the gauges. Conditions of the license and Rules and Regulations for Control of Sources of Ionizing Radiation must be followed at all times by all personnel involved with or supervising the use of nuclear gauges.

Chapter

9

BUILDINGS AND GROUNDS

HOUSEKEEPING
Housekeeping not only refers to cleanliness, it can also be an orderly arrangement of operations, tools, equipment, storage facilities and supplies resulting in more efficient construction and maintenance. All buildings and grounds should be kept clean and free from clutter and debris.

EMERGENCY SHOWER AND EYE WASH
All District and Area Headquarters must be equipped with an emergency shower and eye wash station. The surrounding area must be kept clean and free from clutter.

BULLETIN BOARDS
One portion of the bulletin board is recommended for the exclusive posting of safety memoranda. The supervisor is responsible for the prompt posting and the attractive, orderly fashion of posting. Superseded information should be removed.

MATERIAL SAFETY DATA SHEETS (MSDS)
MSDS should be readily available in areas where chemicals are being used or stored.

FIRE PROTECTION
All combustible liquids should be stored in approved containers. Observe NO SMOKING regulations posted throughout buildings and grounds.
Many fires are small at origin and may be extinguished by the use of portable fire extinguishers. It is strongly recommended that the Fire Department be notified as soon as a fire is discovered. This alarm should not be delayed awaiting results of application of portable fire extinguishers.

1. Fire extinguishers should be mounted in an appropriate position on a fire red board or red painted background.
2. One fire extinguisher must be provided for each 2500 feet of floor space.
3. Portable extinguishers should be maintained in a fully charged and operable condition and kept in their designated places at all times when not being used.
4. Cabinets housing extinguishers should not be locked.
5. Extinguishers should not be obstructed or obscured from view.
6. Travel distances for portable extinguishers should not exceed 50 feet (15.25 meters).

7. Extinguishers should be inspected monthly or at more frequent intervals when circumstances require.
8. When an inspection reveals tampering, damage, impairment, leakage, under/overcharge or corrosion, the extinguisher should be subjected to applicable maintenance procedures.

FIRE EXTINGUISHER SELECTION CHART

Basic Recommendations of Underwriters' Laboratories, Inc.,
Factory Mutual, and National Fire Protection Association

A		B		C	
ORDINARY COMBUSTIBLES		**FLAMMABLE LIQUIDS**		**ELECTRICAL EQUIPMENT**	
Wood Cloth Paper	Rubbish Plastics	Paint Oil	Grease Gasoline	Motors Controls	Panels Wiring

TYPE	OPERATION PRINCIPLE	CLASS A	CLASS B	CLASS C
DRY CHEMICAL Quick Aid	Specially treated sodium bicarbonate base dry chemical powder extinguishers are available in cartridge and pressurized types. Quick Aid is a conventional dry chemical powder of proven dependability. It is moisture resistant and free flowing. Extremely effective on Class B and C fires.	Small surface fires only	OK	OK
DRY CHEMICAL Purple 'K'	Specially treated potassium bicarbonate dry chemical powder extinguishers are of the pressurized or cartridge type. Approximately twice as effective as regular sodium bicarbonate types.	Small surface fires only	OK	OK
DRY CHEMICAL Triplex	A universal dry chemical powder extinguisher capable of extinguishing Class A, B and C fires. Very effective on Class A overhead fires because of its clinging characteristics. Small Capacity Extinguishers which are charged with this dry chemical are rated on Class B and Class C fires, but have insufficient effectiveness to earn the minimum 1A rating even though they have value in extinguishing smaller Class A fires.	OK	OK	OK
DRY CHEMICAL Foam Compatible	Stops flammable liquid fires faster. Extinguishers of this type may be used as a single fire-fighting agent or simultaneously with foam equipment. Meets Coast Guard and Navy requirements. Available in pressurized and cartridge types.	Small surface fires only	OK	OK
CARBON DIOXIDE	Contains carbon dioxide under pressure which is released by squeezing valve lever; the Snow Fog discharge is directed on the fire through a funnel-shaped horn.	Small surface fires only	OK	OK

GENERAL SHOP SAFETY RULES

1. Keep air hose and electrical cords flat on floor.
2. Use same size jack stands when multiples are used on same vehicle.
3. Never work under elevated vehicles or equipment without jack stands in place.
4. Take the key out of ignition while working on equipment.
5. Never start equipment from ground, always from operator's seat.
6. Never engage mowers in shop.
7. Always use bed prop when working under raised dump bed.
8. Never use air pressure to blow dirt off of skin.
9. Clean up spills immediately.
10. Always raise shop doors all the way when entering and leaving.
11. Always use hoist for heavy lifts, get help when needed.
12. Keep hoist control switches clearly marked.
13. Replace frayed hoist cables.
14. Use double safety hooks when using long chains to lift items so the load won't shift.
15. Always use goggles when working around batteries.
16. Keep aerosol cans out for welding shop.
17. Use rubber gloves when working on chemical spray rigs.
18. Turn on exhaust fans when running engines in shop.
19. Never use ether to help seat tubeless tires.
20. While working under vehicles or equipment, wheels must be chocked.

BURNING, CUTTING AND WELDING

Protective goggles or shields should be worn by welders at all times during burning, cutting and welding operations. Leather aprons should also be worn by welders. A protective shield of ply board or other appropriate materials should be used when there is no enclosed welding shop for the protection of employees and the public. Unauthorized personnel should not be permitted in the vicinity.

The welding hose should be periodically inspected for wear on hose or fittings. Worn items should be replaced. When cutting or welding on metal that gives off a toxic fume, adequate ventilation should be used and efforts should be exerted to keep the fumes blown away from the area.

TIRE REPAIR

A tire safety rack for airing tires with multi-piece rims is available in each District or area wherever tires are changed. This rack should be utilized by all personnel airing safety rim tires. A chain is suggested as an added precaution but does not substitute for the rack. A clip-on chuck with sufficient hose length is also required to permit the employee to stand clear of the potential trajectory of rim components.

PITS AND LIFTS

1. Protect open pits and holes at all times.
2. Do not allow unauthorized employees to enter a pit.
3. Clean grease pits only with approved cleaner; never use gasoline.
4. Do not remain in a vehicle while it is on the lift or being raised.
5. Never raise a loaded truck on a lift.
6. Before lowering a lift, ensure that it is properly positioned and that everyone is clear.

7. Remain at the control valve while the vehicle is being lowered.
8. Ensure that all is clear before backing the vehicle off the lift or pit.

HYDRAULIC MECHANISM - RAISED

Any dump bed or rotary mower hydraulically controlled should be blocked or chained for safety. Do not rely on the hydraulic mechanism.

BATTERY ACTIVATION

Eye protection, rubber gloves and rubber aprons shall be worn by employees assigned to battery handling. Open flames or sparks must be kept away from batteries. Use battery tongs or other appropriate lifting devices when removing or lifting batteries. Batteries can explode during activation. Obtain help if necessary. "NO SMOKING" signs should be mounted in this area or on the battery charger.

TO JUMP-START, REMEMBER:

1. Batteries should be the same voltage.
2. Both negative posts should be grounded.
3. Check fluid; check for freezing.
4. Ensure that cars are not touching.
5. Turn ignitions and accessories off, put gears in "park" or "neutral", and apply the brakes.

SPRAY PAINTING

1. Install and use ventilation and exhaust systems whenever spray operations are conducted inside a building. Buildings or areas in buildings are to be fireproof where mixing and storage is conducted.
2. Smoking is prohibited in or near all enclosed paint spray areas.
3. Clean all spray areas including fans, ducts or blowers used in the exhaust system frequently to eliminate fire hazards.
4. Place scrapings and sweepings from painting operations in a metal container immediately and remove from the building.
5. Keep spray guns, hoses, valves and tanks clean and free of clogging.
6. Install and maintain a safety relief valve and pressure gauge on all pressure tank systems. Protect these valves and gauges against tampering so the pressure will not be increased beyond a safe limit.
7. Use an explosive-proof motor in portable spray equipment and ensure that all electrical equipment is well grounded.
8. Contain all paint materials in closed receptacles to prevent the escape of flammable vapors.
9. Avoid the use of paints or lacquers containing toxic materials.
10. Only allow experienced and authorized employees to operate, adjust or repair paint spraying equipment.
11. Use approved goggles and respirators when engaged in this operation.
12. Wear full-length clothing and coat exposed skin with a bland cream.
13. Clean the skin immediately after painting with a cream or cleaner not injurious to the skin. The use of turpentine or thinner as a cleaning agent is not recommended.

SMALL TOOLS

Only tools that are in good condition should be used. Some of the conditions that constitute a defective tool are as follows: burred or mushroomed heads on hammers, sledges, mauls and chisels; post driving caps; sprung jaws; dulled edges on cutting tools; splintered, broken, rough or loose tool handles, etc. Tools that are not in good condition should either be repaired or replaced with new tools.

Always use the proper tool for the job. For example, do not use a wrench as a hammer or a screwdriver as a chisel, and use nothing but hammers, mauls or sledges for striking.

Workers must be positive that they are in proper position before using axes, hatchets, sledge hammers and similar tools. They should have proper stance, a firm footing and be clear of obstructions and fellow workers.

After tools have been used, they must be cleaned and placed in proper order in the storage rack.

OFFICE SAFETY

Some rules and regulations pertaining to safety in the office are as follows:

1. If it is necessary to move office equipment or furniture, ask for help.
2. Do not use razor blades for cutting paper.
3. Do not use pins to fasten papers.
4. Contact Building Maintenance personnel to clean up and remove broken glass. If assistance is not available, take precautions and wrap broken glass and other sharp objects in heavy paper, mark “broken glass” and place beside, not in, the wastebasket.
5. Allow passengers to leave elevator before entering.
6. Approach and open doors with caution to avoid striking someone with door.
7. Do not run.
8. Stay to the right in corridors and corners.
9. Use handrail when ascending and descending stairs.
10. Keep stairways clean, clear and well-lit.
11. Do not engage in horseplay.
12. Keep material off radiators, especially paper.
13. Never clean or adjust an office machine while in motion.
14. Ensure that electrical extension cords are in good condition and are secured so that they will not get underfoot.
15. Do not overload electrical circuits.
16. Distribute weight in file cabinets to prevent top-heavy condition.
17. Open only one file drawer at a time, and close after use.
18. Empty top drawers of file cabinets first.
19. Load heavier cabinet drawers from the bottom upwards.
20. Push files and desk drawers back into place before leaving files.
21. Ensure that guards are in place on paper cutters.

FLAMMABLES

Storage

All storage of flammable liquids and gases should be in accordance with local, state and federal laws. All sources of ignition are prohibited in areas where flammables are stored, handled or processed. Storage warning and "NO SMOKING" signs must be prominently posted. Storage tanks should be equipped with proper relief vents. Vents should not be located close to open flame, heating apparatus or any source of ignition. Flammable liquids or lubricating oils in drums, cans or other containers stored inside are to be guarded against any ignition source and segregated in a fireproof room or separate building which is well vented whenever possible. A ventilated metal cabinet or box should be provided for the storage of more than 10 gallons of oil, varnish, lacquer or other volatile liquids. The cabinet should be posted with, *"FLAMMABLE – NO SMOKING WITHIN 50 FEET."*

Transportation

Flammable liquids should not be transported in any open vessel. Only approved, sealed containers are to be used. Barrels, cans or vessels containing flammable liquids should be secured and chocked in any vehicle before moving. Open lights such as lanterns are not to be used on equipment transporting any flammable liquid. Extra or emergency gasoline or other flammable liquids must be carried in approved safety cans with a capacity of not more than five gallons. These should be painted red and plainly marked.

Handling and Use

1. Refueling of any type of equipment, trucks or passenger cars while motor is running is strictly prohibited.
2. All tanks, hoses and containers are to be in metallic contact while flammable liquids are being poured.
3. "Buck-eye" safety nozzles, or their equivalent, must be used for dispensing gasoline on hand or power driven pumps.
4. Flashlights and portable lamps used in connection with the handling of flammables should be flash-proof, insulated and approved.
5. All rooms, buildings and enclosures where flammables are handled should be well ventilated.
6. Approved fire extinguishers should be provided and conspicuously placed and marked in any area where flammables are stored, handled or used.
7. Flammables should never be used as cleaning agents.
8. A tank to be filled should always be gauged to avoid the danger of an overflow.
9. Welding, cutting, riveting or other work involving ignition should not be performed on any storage tank which has contained flammables until such tank has been completely filled to the top with water.
10. Accumulations of rust or scale on a tank which contains or has contained flammable liquids should be removed with no sparking tools such as wooden mallets.
11. Any spills of flammables should be cleaned up immediately, particularly in the vicinity of permanent gas and fuel pumps. Flammable liquids must never be placed in glass or plastic containers.

LABORATORY SAFETY

General Laboratory Safety

1. Avoid distracting or startling other workers; no practical jokes or horseplay
2. Wear appropriate personal protective equipment (PPE) at all times. Appropriate eye protection should be worn when handling chemicals. Wear appropriate gloves when the potential for contact with toxic materials exists. A lab apron or lab coat may be worn to protect clothing from damage. Additional protection such as goggles or face shields may be necessary at times. Wear safety glasses or face shields when working with hazardous materials and/or equipment.
3. Dress appropriately. Shorts, tank tops and other apparel that leave skin exposed have no place in a laboratory. Wear shoes at all times in the laboratory but do not wear sandals, or perforated shoes.
4. Do not use fume hoods as storage areas. Avoid blocking the airfoil, baffles and rear ventilation slot.
5. Know the location of all safety equipment (e.g. first aid kit, eyewash, fire extinguisher, safety showers, spill kit) and how to use them.

Personal Protection

1. Be careful when lifting heavy objects. Lift comfortably, avoid unnecessary bending, twisting, reaching out, and excessive weights. Lift gradually and keep in good physical shape.
2. Confine long hair and loose clothing or items that may present a potential hazard.
3. Do not work alone in a laboratory if the procedure being conducted is hazardous.
4. Be well informed of the hazards related to relevant chemicals. Thoroughly review the Material Safety Data Sheet (MSDS) and seek information on chemicals being used.
5. Know the location and how to use emergency equipment, including safety showers and eyewash stations.
6. Never block safety equipment or doors and keep aisles clear and free from tripping hazards.

Housekeeping

1. Keep the work area clean and uncluttered with chemicals and equipment. Handle spills as they occur to prevent further damage.
2. Keep aisles clear.
3. Maintain unobstructed access to all exits, fire extinguishers, electrical panels, emergency showers, and eyewashes.
4. If leaving a lab unattended, turn off all ignition sources and lock the doors.
5. Do not store heavy items above table height. Any overhead storage of supplies on top of cabinets should be limited to lightweight items only. Also, remember that a 36" diameter area around all fire sprinkler heads must be kept clear at all times.

Basic Rules and Procedures when Working with Chemicals

1. Pregnant women should take special care with exposure to certain chemicals, which can be harmful to fetal development. Consult the Material Safety Data Sheet for further information or contact your physician.
2. Use adequate ventilation. Use only those chemicals for which the quality of the available ventilation system is appropriate. Avoid unnecessary exposure to chemicals.
3. Do not smell or taste chemicals.
4. Avoid eating, drinking, chewing gum or applying cosmetics in areas where laboratory chemicals are present. Wash your hands after handling chemicals.
5. Do not work alone in a laboratory if the procedure being conducted is hazardous.
6. Chemicals should be properly labeled and stored. If a chemical solution is produced in the laboratory, it shall be properly labeled with composition and hazards and, if applicable, date produced and initials of producer.
7. Avoid storage, handling or consumption of food or beverages in chemical storage areas.
8. Do not store food or beverages in refrigerators which are used for laboratory operations.
9. When storing, handling or consuming food or beverages, do not use glassware or utensils which have been used for laboratory operations.
10. Be well informed of the hazards related to relevant chemicals. Thoroughly review the Material Safety Data Sheet (MSDS) and seek information on chemicals being used.

Exercise caution in handling volatile, flammable solvents. Never use an open flame in the same area.

Chapter

10

FIELD DATA COLLECTION ACTIVITIES

GENERAL INFORMATION

Employees engaged in data collection while traveling at reduced speed should drive as far to the right of the traveled roadway as the nature of the work permits. Employees should park on the shoulder or as far as possible to the right of the traveled roadway when brief stops are necessary. When long-term parking is required, the vehicle should be parked off the roadway and in such a manner so that it will not block the sight distance of approaching traffic.

Vehicles used in data collection activities are to be equipped with the necessary safety devices such as flashing lights, warning signs, beacons, etc. Extreme caution must be exercised when it is necessary to make measurements or conduct other activities on the roadway surface. An observer to detect oncoming traffic is advisable

PORTABLE RECORDERS

The employee must use reasonable care and safety equipment to forewarn the motoring public when placing, adjusting or removing a recorder.

OBSERVING TRAFFIC

Employees collecting data by observation must, when possible, park in places that are out of the way such as driveways, parks, parking areas or extra-wide shoulders. It may be necessary to use parking lights or other adequate warning devices.

TRAVELER SURVEYS AND WEIGHING OPERATIONS

All surveys should be conducted under supervision. Sometimes surveys are assisted by the Arkansas Highway Police. When warning signs are needed, a sufficient number of warning signs must be located in advance of the survey location to inform the public. For night operation, adequate illumination should be provided. All signs must be retro reflectorized and blinker lights placed in advance of the station.

The interviewer should stand between the traffic control signs and direct drivers to stop or proceed by the appropriate hand signal. The “proceed” signal is to be given only when the interviewer has resumed position between the control signs.

DRONE POLICY

1. The use of unmanned aerial systems during official duties requires a current ’14 CFR Part 107 Small Unmanned Aircraft Systems’ certification to be on file within the Department’s workforce management system.
2. The use of personal unmanned aerial systems is not permitted for Department activities.
3. All Department unmanned aerial systems must be a part of an accountability system that records telemetry data of flights.

**Exceptions to these policies must receive UAS Committee approval.*

Chapter

11

EMERGENCY PROCEDURES

TORNADO

All employees should familiarize themselves with the necessary action to take in the event of a tornado.

1. When a tornado threatens, immediate action can save your life!
2. Stay away from windows, doors and exterior walls. Protect your head.
3. In small buildings, go to the basement or to an interior part of the lowest level (closets, bathrooms, interior halls). Get under something sturdy.
4. Go to pre-designated shelter areas. Interior hallways on the lowest floor are usually best.
5. In portable buildings or vehicles, leave and go to a substantial structure. If there is no shelter nearby, lie flat in the nearest ditch, ravine or culvert with your hands shielding your head.

Tornado Watch….	Conditions are favorable for tornado development. Continue normal activity but watch for tornadoes!
Tornado Warning….	A tornado has been sighted or indicated by radar and may be approaching. Seek shelter immediately!

FLASH FLOOD

Heavy rainfall, even for short periods, may be quickly followed by flash floods in mountain areas. Remember this when going into hilly terrain. A little caution can save your life.

1. Stay away from natural streambeds, arroyos and other drainage channels during and after rainstorms. Water runs off the higher elevations very rapidly, causing the natural drainage system to overflow with rushing floodwaters and their cargo of rocks, mud, trees and other debris.
2. Abandon stalled vehicles in flooded areas if you can do so safely. Floodwaters may rise and sweep the vehicle away. Many deaths have resulted from attempts to move stalled vehicles.
3. Keep alert to signs of wet weather, either rain or signs of rain (thunder and lightning) nearby or in distant hills.
4. Keep as informed as you can. Stay tuned to radio or television stations in the area for information on developing weather and flood conditions. If you are out of broadcast range, be sure to watch for these indicators of flash flooding: increased speed of river flow and steady or rapid rise in river level. Be prepared to move to safety.

Flash-Flood Watch	Heavy rains may result in flash flooding in the specified area. Be alert and prepared for a flood emergency requiring immediate action.
Flash-Flood Warning	Flash flooding is occurring or is imminent in certain areas. Move to safe ground immediately.

EARTHQUAKE

1. IF LOCATED INSIDE A BUILDING
    a. Duck or drop to the floor
    b. Take cover under a sturdy desk or against an interior wall and protect your head and neck with your hands.
    c. Stay clear of windows, hanging objects or shelves where objects may fall
    d. Hold on to furniture that covers you and if the shelter moves, hold on and move with it.
    e. Remain silent so directions can be heard above the noise of the earthquake. Do not immediately exit building or try to re-enter.
2. IF LOCATED OUTSIDE A BUILDING
    a. Move as far away from buildings, trees, exposed wires and other falling objects as possible. The safest place is in the open.
    b. Drop to your knees with your head down, hands clasped behind neck, arms against ears, and eyes closed.
3. EVACUATION OF A BUILDING
    a. Be prepared for aftershocks and only evacuate after ground shaking ceases.
    b. Building evacuation following an earthquake is imperative due to the possibility of secondary hazards such as explosions and fires.

EMPLOYEE RESPONSIBILITIES DURING DISASTERS

Arkansas has experienced disasters caused by floods, tornadoes and other catastrophes. The Department is almost certain to have employees at or near the scene of such catastrophes, especially those employees of the Construction and Maintenance Divisions. During such emergencies, the Department and its employees can render a valuable service to the citizens of the state.

The first function of maintenance forces during or following a disaster is to open the highways and restore traffic, provided that it is safe to do so and that it will not interfere with rescue work. It may also be necessary for the maintenance employees to temporarily direct or control traffic until the arrival of local or state police.

The services of people trained in CPR, first aid, and in the use of first aid supplies (carried in all Department equipment) may be extremely valuable in alleviating suffering and in saving lives. The first employee of the Department at the scene of a catastrophe should evaluate the situation and report conditions by the quickest means to the respective District Engineer's office and request instructions or assistance if necessary. The work of employees of the Department during such times should be coordinated with the activities of local authorities or other agencies.

TRAFFIC INCIDENT MANAGEMENT (TIM)

Traffic incident management (TIM) is a coordinated process for responding to and clearing traffic incidents, such as crashes, stalled vehicles, and debris on the road. The goal of TIM is to safely and quickly restore traffic flow, while minimizing the impact on motorists, emergency responders, and crash victims.

TIM programs can help to:

- Reduce travel delays and congestion
- Improve safety for responders and travelers
- Support energy savings and better air quality
- Save lives, time, and money

Executive Leadership are requiring leaders in certain divisions to be trained in **Traffic Incident Management**. The Health and Safety Section along with the Workforce Development Section will collaborate to ensure this requirement is met.

The titles below are the titles that shall have this training.

District Maintenance Engineers
District Construction Engineers
Staff Engineers (Bridge Operations, Maintenance, and TSMO)
District Maintenance Superintendents
Resident Engineers
Assistant Resident Engineers
Engineers (Bridge Operations, Maintenance, TSMO, and RE Offices)
Maintenance Supervisors
-Maintenance Superintendents (Districts and Statewide Crews)
- Assistant Superintendents (Statewide Crews)
- Area Maintenance Supervisors
- Assistant Maintenance Supervisor
-Crew Leaders (Districts and Statewide Crews)

SECURITY

The Department strives to provide a secure environment for all employees. Evolving security concerns require the Department to continuously update its security measures. For further information and guidelines related to security, contact the Workforce Development, Health and Safety Section or the Arkansas Highway Police Division.

ARKANSAS DEPARTMENT OF TRANSPORTATION

Date: _____

I understand and agree that it is my responsibility to have a thorough knowledge of and comply with these safety rules and regulations governing employees and equipment from the Arkansas Department of Transportation.

I pledge to be alert in the performance of my assignments in order to help prevent accidents to myself and others.

_____
Name

_____
Title

_____
Location

_____
Division/District

DIVISION/DISTRICT COPY
(please keep on file)

NOTES