

NCDOL INDUSTRY ALERT

Division of Occupational Safety and Health

Traffic Control and Safety in the Work Zone



Identifying Safety Needs

The N.C. Department of Labor recognizes that the safety and health of workers, performing the many varied tasks during a temporary traffic control situation, should always be analyzed before work begins. Employers are responsible for assessing the workplace to determine if hazards are present or likely to be present that necessitate the use of protective equipment, including personal protective equipment.

Construction workers, public-safety workers, including fire fighters, parole/probation officers and corrections officers, as well as others that may be in a position of directing traffic, are all at risk from the hazards posed by traffic. Short duration temporary traffic control situations, such as those involving garbage collectors or funeral directors, should not be overlooked. Temporary conditions that are unexpected to drivers can be the most dangerous to the roadway worker.

The costs (in money, time, physical problems and mental distress) associated with vehicle-related accidents and injuries can be extremely high.

Inside this edition ...

- Identifying Safety Needs
- Traffic Control and Safety
- Planning Principles
- Worker Safety Considerations
- Worker Safety Principles

The National Highway Traffic Safety Administration reports that on-the-job traffic accidents cost \$43 billion each year, averaging \$22,000 per crash and \$110,000 per injury. But another cost is greater than money—the loss of life.

Traffic Control and Safety



Planning is the most important element of street or highway worksite safety. Hazards at worksites must be identified based on an evaluation of the processes, and the worksite overall, before a plan can be developed. Planning makes the difference between the success or failure of any job. Proper and adequate placement of traffic control devices is the critical responsibility of those who are in charge over the particular roadway where the work area is located. The pre-job planning responsibility may require initial and periodic inspection of existing devices and conditions for the safety of the workers and motorists. Before roadside hazards can be reduced or eliminated, employers and employees must become familiar with the possible hazards.

When it comes to road work, planning means designing a traffic control plan that meets the current Part VI of the *Manual on Uniform Traffic Control Devices* (MUTCD) standards. Laying the design out on paper helps take the competent person, and the traffic control crew, through the work step by step and identifies significant factors that could affect traffic control and thereby safety at the worksite. Get an overhead view of the roadway that you will be working on. List the types

of processes, their locations within the roadway, and the locations of access and egress needs from construction-related traffic. Identify significant intersections and access points that may intersect within the traffic control zone. Identify and contact businesses and residents whose access points fall within the traffic control zone or would otherwise be affected by the worksite, and assess their needs. Devise a written traffic control plan.

Part VI of the *Manual on Uniform Traffic Control Devices* provides the design and application specifications to meet the special demand for uniform standards for traffic control during construction and maintenance operations on streets and highways in the United States. Temporary traffic control devices (cones and other channelization devices) and advanced warning signs (flagger ahead and lane closure) are used to direct traffic around construction zones. The criteria for design will vary based on environmental conditions such as illumination, weather, traffic speed and other factors of consideration. Although each work zone will have individual traffic control plans based on the type of worksite processes in progress, all traffic control plans will

have similarities that are inherent to every work zone.



Fundamental Principles for Planning

- Safety is primary. Use whatever controls are necessary to be sure traffic and workers will be safe.

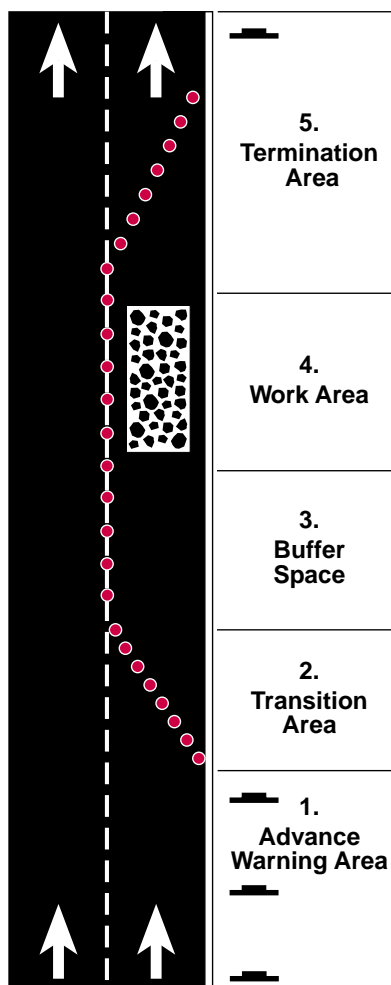
Continued on page 2

- Signs need to be seen to be obeyed. Increase the size or height of the signs to make them more visible.
- Increase the length of the warning area when traffic is backed up, when there is a curve, hill or other obstruction, and on high-speed, high-volume roads.
- Allow room for the buffer space for additional protection of traffic and workers.
- Additional safety and warning are needed when traffic is diverted into lanes normally used by opposing traffic.
- Channeling devices should break or collapse when hit. Do not use concrete or other materials that may be hazardous on devices. Do not use rigid bracing for barricades.
- All devices used at night should be reflectorized or illuminated.
- Remove confusing pavement markings as soon as practical. Use temporary markings that can be easily removed to outline a new path.
- If warning lights are to be used, use steady burning lights for channelization and flashing lights for warning.
- Periodically inspect the devices. Repair or replace any damaged or missing devices. All devices should be clean.

- Be credible. Don't advise motorists of a condition that doesn't exist. Remove or cover all signs or devices that are not in use.



There are five parts of a work zone:



1. All traffic control zones should have an **advance warning area**. The advance warning area is important to alert drivers to potentially unusual or hazardous conditions so that driving speeds and driving practices can be adjusted in preparation for such conditions. The advance warning area contains the warning signs.

2. A **transition area** is required when lanes are to be closed, the travel path shifted, or both, to accommodate the work space.

3. **Buffer space** provides an additional element of safety before the actual

work space. It provides a recovery space for errant vehicles and separates traffic flow from the work activity. Work activities should not take place and equipment and materials should not be stored within the buffer area.

4. The **work area** is where the maintenance or construction work is taking place, including space for equipment and materials.

5. The **termination area** is used at worksites to allow traffic to clear the activity area and return to normal traffic operations. It is the final portion of the traffic control zone that extends from the end of the activity area to the sign denoting the end of the work zone. (If tapers are used in the transition area for lane closures, they will be required in the termination area.)



Worker Safety Considerations

Work areas present temporary and constantly changing conditions that are unexpected by the traveler. Further, these work area conditions almost always present situations that are more confusing for the driver. This creates an even higher degree of vulnerability for the personnel on or near the roadway. Of particular importance is maintaining work areas with traffic flow inhibited as little as possible, providing standard and clear traffic control devices that get the driver's attention and provide positive direction.

Following are key elements of traffic control management that should be considered in any procedure for ensuring worker safety:

Training: All workers should be trained in how to work next to traffic in a way that minimizes their vulnerability. In addition, workers with specific traffic control responsibilities should be trained in traffic control techniques, device usage and placement.



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Worker Clothing: Workers exposed to traffic should be attired in bright, highly visible clothing similar to that of flaggers.

Barriers: Barriers should be placed along the work space depending on such factors as lateral clearance of workers from adjacent traffic, speed of traffic, duration of operations, time of day and volume of traffic.

Speed Reduction: In highly vulnerable situations, consider reducing the speed of traffic through regulatory speed zoning, funneling, and use of police, lane reduction or flaggers.

Lighting: For nighttime work, lighting the work area and approaches may allow the driver better comprehension of the requirements being imposed. Care should be taken to ensure that the lighting does not cause blinding.

Special Devices: Judicious use of special warning and control devices may be helpful for certain difficult work area situations. These include rumble stripes, changeable message signs, hazard identification beacons, flags and warning lights.

Road Closure: If alternate routes are available to handle detoured traffic, the road may be closed temporarily during times of greatest worker hazard—which, in addition to offering maximum worker safety, may facilitate quicker project completion and thus further reduce worker vulnerability.

Like other provisions of work area safety set forth in this part of the MUTCD, the various traffic control techniques must be applied by a qualified person after appropriate engineering studies and with sound engineering judgment and common sense.

Fundamental Principles for Worker Safety

Inspect as necessary, depending upon the complexity and length of the project. Inspect at least twice a day, and whenever you observe significant traffic

pattern changes. Inspections, at a minimum, should be done before work begins and midday.

Each person whose actions affect work zone safety should receive training relative to the required duties. Don't assign untrained workers the responsibility for setting up and maintaining the system.

Be credible. Don't advise motorists of a condition that doesn't exist. Remove or cover all signs or devices that are not in use.

Treat traffic control as a priority equal to the job being performed.

Design a temporary traffic control system that doesn't create confusion and is easy to navigate. Traffic movement should be restricted as little as practicable.

Have a plan suitable to the project.

Don't bother traffic any more than necessary. Work during off peak hours. Park and work off the travel way when possible.

Don't expect drivers to slow down until they see some kind of activity. Drivers should be guided in a clear and obvious manner throughout the work zone.

Don't make drivers think, respond, brake or maneuver rapidly.

Develop a plan for work and emergency vehicles before it is needed.

Reduce the time workers are exposed to traffic to minimize danger.

Traffic control's goal is to guide drivers in a definite, clear manner.

Give plenty of advanced notice so that drivers have time to process the warning and respond appropriately to the changes.

Use flaggers, wearing high visibility red or orange warning garments, to supplement the other traffic control measures to improve safety. Workers exposed to traffic must be seen by motorists.



Changing weather and traffic conditions may make it necessary to modify the traffic control system so that it remains effective.

Additional Resources

This publication was prepared incorporating information specified in Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) and OR-OSHA publications. Copies of the MUTCD publication may be obtained from the American Traffic Safety Services Association (ATSSA), 15 Riverside Parkway, Suite 100, Fredericksburg VA 22406-1022. Phone: (540) 368-1701. Fax (540) 368-1722. The latest edition of the MUTCD is also available on the Federal Highway Administration's Web site <http://mutcd.fhwa.dot.gov/>.

Applicable NC Standards

29 CFR 1926.20, *General safety and health provisions*

29 CFR 1926.21, *Safety training and education*

29 CFR 1926.95, *Criteria for personal protective equipment*

29 CFR 1926.200(g), *Traffic signs*

29 CFR 1926.201, *Signaling*

29 CFR 1926.202, *Barricades*

Disclaimer

This fact sheet provides only general information for traffic control requirements and should not be considered a complete summary of the North Carolina Occupational Safety and Health Standards or MUTCD.

Photocopying and wide dissemination of this publication is encouraged.

500 copies of this public document were printed at a cost of \$83 or \$.16 per copy.

High-Visibility Clothing

All workers exposed to traffic must be attired in bright, highly visible clothing, similar to flaggers. Greater visibility of workers wearing the appropriate garments in traffic control zones (such as retroreflective garments at night), will help prevent the hazards associated with struck by and struck against hazards.

- For daytime work, a vest, shirt or jacket that is bright orange, yellow, strong yellow-green or fluorescent versions of these colors is acceptable.
- For nighttime work, or work in low visibility light conditions, the garments must also be retroreflective. The color must be orange, yellow, white, silver or strong yellow-green and must be visible at a minimum of 1,000 feet.
- The retroreflective clothing must be designed to clearly identify the wearer as a person and be visible through a wide range of body motions.
- Public safety personnel, as well as construction workers, may be used as flaggers in some locations, including urban intersections, where enforcement of traffic movements is important. High visibility red or orange warning garments must be provided and worn. Warning garments worn at night must be of reflectorized materials.
- Public-safety personnel may also be used on freeways where traffic is channeled around work sites and it is necessary to ensure that advisory and regulatory speeds are being enforced. Bright, highly visible clothing, appropriate for flaggers, should be worn.

