Work zone safety

The **engineers and planners** have the responsibility to make sure the work zone is designed and operating properly with safety in mind. Supervisors of road construction crews have the responsibility to ensure that all components of the traffic control plan are being implemented and that employees have been adequately trained.

Construction best practices

Work zones include construction, maintenance, and utility work on a road, street, or highway. A work zone is typically marked by signs, channelizing devices, barriers, pavement markings, and/or work vehicles. It extends from the first warning device, such as a warning sign or high intensity flashing light, to the last warning sign or temporary traffic control device (ttcd).

Most work zones will have the following components:

- **Advance warning area** – Signs, arrow panels and/or message boards advise what to expect.
- **Transition area** – Cones, drums, vertical panels, barricades, and/or other channelizing devices are used to redirect, channelize or shift traffic from the normal path to a new path.
- **Buffer space** – Cones, drums, barricades, and/or attenuators provide an area of separation between traffic flow and the work area as well as provide recovery space for errant vehicles.
- **Activity area** – Where the work (construction, maintenance, or utility) is being done.
- **Termination area** – Extending downstream from the work area, it returns traffic to normal flow and concludes with the final sign or ttcd.

Who regulates work zones?

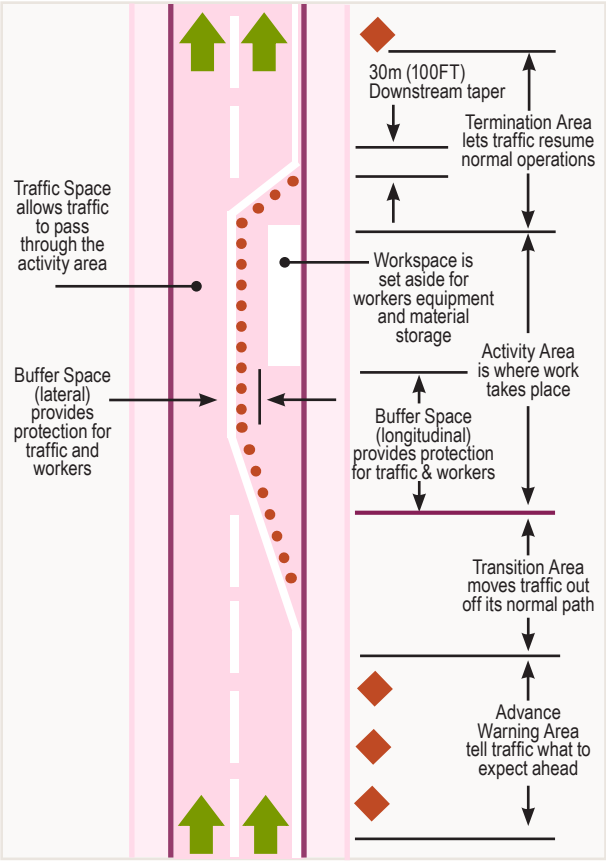
The FHWA develops and maintains the Manual on Uniform Traffic Control Devices (MUTCD), which provides for uniform design and setup of highway work zones. The primary focus of Part 6 of the MUTCD is the interaction between the road user and the work zone.

The MUTCD contains extensive specifications for signage, pavement and curb markings, traffic signals, and markings of school zones, bicycle facilities, and highway-rail crossings. It also prescribes temporary traffic control measures for numerous scenarios involving lane closures, lane shifts, detours, shoulder work, median crossovers, mobile operations, and blasting. The MUTCD also addresses topics such as employee training, personal protective equipment, speed reduction, barriers, and lighting, as they apply to highway construction.

To download the most current edition of the MUTCD, refer to Manual on Uniform Traffic Control Devices (MUTCD) – FHWA. When a new edition or revision of the MUTCD is issued, states have two years to adopt it, with or without a State supplement, or to adopt a State MUTCD that is in substantial conformance with the new edition of the National MUTCD. Refer to MUTCD's & Traffic Control Devices Information by State to determine the edition used in your state.

Nighttime roadwork has increased over the last few years and will continue to grow out of necessity. While there are usually reduced traffic volumes at night, the safety issues relating to traffic control are a major concern. High visibility apparel and temporary illumination are essential to ensure that workers are visible to all drivers (including vehicle traffic and construction mobile equipment). The following strategies, developed by the FHWA, can improve traffic safety and mobility in night work zones:

- All workers should wear high-visibility apparel and light colored clothing.
- The use of colors such as yellow-green for worker apparel may help to differentiate the worker from the orange colored work vehicles, signs, drums, etc.
- Temporary illumination should be provided at all work locations to make workers visible.



Component Parts of a Temporary Traffic Control

- An operational plan should be developed for night work to address risks associated with worker exposure to traffic, work vehicles and equipment.
- Workers should be trained in nighttime procedures to avoid hazards associated with reduced visibility.
- Use retro-reflective materials on all channelizing devices.
- Channelizing devices used at night should be inspected on a regular basis to ensure they are in good physical condition, and properly placed.
- Close spacing of channelizing devices, at 40 feet or less, provides more positive driver guidance.
- Two rotating or flashing amber beacons visible from 1,000 feet should be displayed on all trucks and equipment used at night work zones. In addition, vehicles should display 4-way emergency flashers when stopped or moving slowly in or adjacent to a work zone.
- Vehicles operated by inspectors and supervisory staff within the work zone should use at least one rotating beacon.

Who is responsible for work zone safety

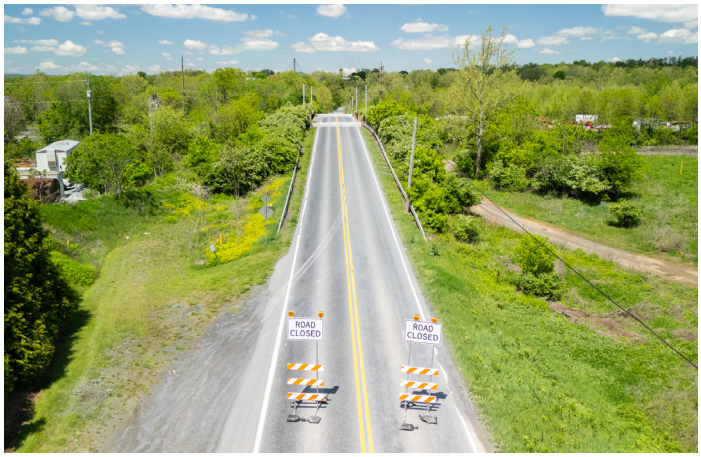
Everyone. The engineers and planners have the responsibility to make sure the work zone is designed and operating properly with safety in mind. Supervisors of road construction crews have the responsibility to ensure that all components of the traffic control plan (TCP) are being implemented and that employees have been adequately trained. Employees working in these work zones must follow all guidelines and procedures, wear appropriate personal protective equipment, and report any potentially dangerous condition they identify. Drivers and pedestrians have the responsibility to always be alert and obey the traffic laws. The police and the courts have the responsibility to make sure that the traffic and work zone laws are enforced. Public safety agencies have the responsibility of responding to and securing crash locations and enforcing traffic laws. Local communities and county and state governments need to allocate funding for safe roads and increase public awareness about work zone safety. Everyone must take responsibility for work zone safety.

The following Injury Prevention Measures are for engineers, planners, and contracting agencies:

- Do not award contracts based solely on a low bid criterion.
- Level the playing field among all potential contractors by specifying appropriate protective systems (e.g. truck-mounted attenuators, concrete barricades) and requiring a written safety program in bid specifications.
- Pre-qualify all contractors and subcontractors to ensure that they have good safety records.

- Through contract language, specify that the traffic control supervisor must have overall responsibility for temporary traffic control.
- Specify a standard for illumination of work zones in bid specifications. Include minimum lighting levels, types of light sources, and minimum areas to be illuminated.
- Close the road completely and reroute traffic where feasible.
- Specify increased taper lengths for night work.
- Specify the use of truck-mounted attenuators (TMAs) whenever work zones are moved.
- Plan the work space to eliminate or decrease backing and blind spots.

The following Injury Prevention Measures are for management and supervisory personnel:



- Develop traffic control plans (TCPs) for all medium, large, and multi-contractor jobs. For small recurrent operations such as filling potholes, routine maintenance, and mowing, a checklist could be used in place of a complete TCP.
- Ensure that a trained traffic control coordinator is present at each job site.
- Train workers in the implementation of the TCP for each project.
- Hold "toolbox" meetings at the job site to discuss and report hazards and close calls and to discuss safety considerations that are needed for performing the tasks.
- Evaluate the effectiveness of the temporary traffic control on a regular basis by walking or riding the work zone looking for evidence of near misses (e.g. skid marks, damaged barricades).
- Authorize the traffic control supervisor to temporarily halt work until unsafe conditions related to temporary traffic control have been eliminated.
- Where worker exposure to traffic cannot be completely eliminated, use positive protective barriers (e.g. TMAs and temporary traffic barriers), to shield workers from intrusions by traffic vehicles.
- Give employees the authority to shut down unsafe equipment without repercussion.
- Train flaggers consistent with their level of responsibility and work zone conditions, and in accordance with applicable state DOT requirements; refer to National ATSSA Train the Trainer Flagger Registration Program for a listing of state flagger requirements.
- Avoid using flaggers under hazardous conditions such as high traffic speeds, inclement weather, night work, and other conditions which limit visibility.
- Provide fluorescent and/or retro-reflective materials on head gear and flaggers' gloves.
- Document in writing work zone setup and changes throughout the course of the project.

The following Injury Prevention Measures are for employees working in work zones:

- Wear high-visibility safety apparel when in work zones.
- Inspect high-visibility clothing regularly and report any damaged or defected clothing.
- Perform pre-shift equipment checks and report any deficiencies. Pictorial equipment checklists make equipment inspections easier.
- Read operator manuals prior to use.
- Never move equipment without making positive visual contact with any workers on foot near the equipment.
- Set parking brakes when leaving equipment unattended and chock wheels when equipment is parked on an incline.
- Always wear your seat belt.
- Report any deficiencies in the temporary traffic control setup.
- Question any portion of the TCP that you don't understand.

Related links

- American Association of State Highway Transportation Officials (AASHTO)
- American Concrete Pavement Association (ACPA)
- American Road & Transportation Builders Association (ARTBA)
- American Traffic Safety Services Association (ATSSA)
- Associated General Contractors of America (AGC)

- Federal Highway Administration
- Federal Highway Administration (FHWA Safety)
- Federal Highway Administration: Manual on Uniform Traffic Control Devices (MUTCD)
- Federal Highway Administration: Turner-Fairbank Highway Research Center
- Federal Motor Carrier Safety Administration (FMCSA)
- Federal Transit Administration
- Institute of Transportation Engineers (ITE)
- Insurance Institute for Highway Safety
- International Safety Equipment Association (ISEA)
- National Asphalt Pavement Association

The Hartford