

Work Zone Intersection Safety

It is a challenge to maintain safety and mobility at intersections in a work zone. For drivers unfamiliar with an intersection, a work zone can be a sudden, potentially dangerous surprise. For motorists who regularly drive through an intersection, a work zone can be a frustrating nuisance because of the way it adds to travel time. But the development and application of well-designed temporary traffic control plans can ensure safe mobility for workers and all road users (motorist, bicyclists and pedestrians including persons with disabilities) in an intersection work zone.

Overview

Work zones at intersections present various engineering design challenges. Intersection crashes represent about 16 percent of the total work zone fatalities in the last 5 years. The task of maintaining mobility and ensuring safety for pedestrians, bicyclists, workers, motorists and transit operations is more demanding at intersections than on road segments. The realignment of travel lanes and reduction of road capacity are often necessary to accomplish reconstruction or rehabilitation, such as pavement replacement, pavement patching, widening a street, utility work and reapplying pavement markings. All of these can cause delays and pose a threat to safety.



Transportation agency coordination with transit, police, fire, emergency medical services, utilities, schools and railroads should occur (especially in urban areas) to alert these organizations to changes in road conditions. Suggesting alternate routes is time well spent to ensure safety and travel time reliability, particularly for school buses and emergency providers.

MUTCD, Part 6, Temporary Traffic Control

The *Manual on Uniform Traffic Control Devices* (MUTCD) contains the basic principles of design and use of traffic control devices for all streets and highways open to public travel, regardless of type or class, or the public agency having jurisdiction. The latest version of the MUTCD, Part 6 titled "Temporary Traffic Control" was published November 20, 2003 and contains the standards, guidance, options and support information related to work zones. Part 6 has been significantly revised and expanded with new signs and revised "Typical Applications" detailed for a variety of street and highway work situations commonly encountered by road users. There is new language about the height and projection of signs in accordance with the American with Disabilities Act. There is also guidance for providing detectable paths for protecting pedestrians with visual disabilities in urban areas. The MUTCD can be accessed at the following Web site: <http://mutcd.fhwa.dot.gov>.

Cones or drums knocked out of alignment by an errant driver or a work vehicle, for example, could result in vehicles being channeled into oncoming traffic. The condition of devices should also be checked regularly to ensure that they continue to perform as intended. Modifications may also be necessary based on changing road conditions or work staging and progress. Safety in a temporary traffic control zone is the responsibility of the contractor, transportation agency and the driver. No traffic control device, however, can overcome the shortcomings of imprudent drivers.



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Work Zone Intersection Safety Goals

Motorists entering and traveling through work zones must be provided with adequate time and distance to make decisions and stop when required. Drivers should never be forced to make unexpected stops or perform unanticipated steering or crash-evasion maneuvers when approaching or within a work zone.

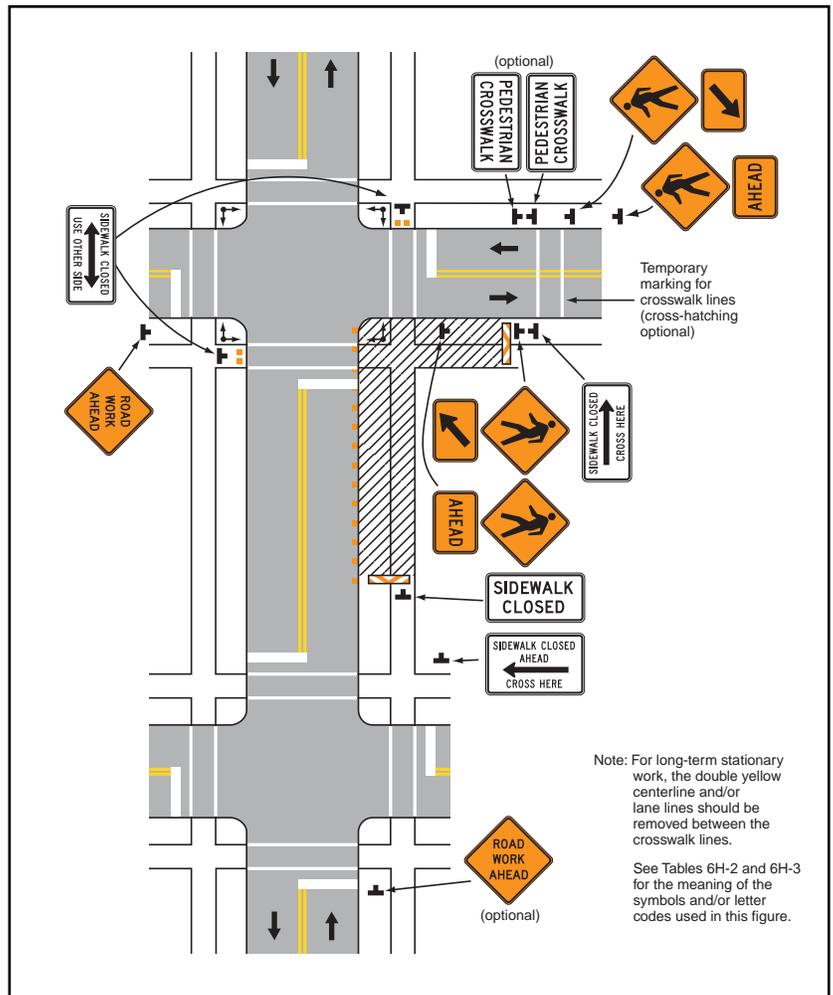
Traffic congestion in intersections should be mitigated to the greatest extent possible. If long queues are expected or are occurring because of a work zone, additional advance traffic control devices may be necessary to provide users with information about lane choice or alternate routes before being trapped in a queue. Long delays often create impatient drivers who may change their usually good driving habits and take unnecessary risks that result in potential hazards to themselves and others. Pedestrians and bicyclists may ignore signs and walk against traffic signals if they are forced to wait too long to be accommodated in a work zone. This increases their vulnerability to vehicles whose drivers may also be frustrated.

Improving Work Zone Intersection Safety

Ensuring a high level of intersection work zone safety depends on proper pedestrian accommodation, worker safety and visibility and proper traffic control.

Pedestrian Accommodations In Work Zones

- ◆ Access to temporary transit stops should be provided;
- ◆ Temporary crosswalk facilities shall be detectable;
- ◆ Curb parking shall be prohibited within 15 m (50 ft.) of the mid-block crosswalk;
- ◆ Pedestrian signals should be deactivated for closed crosswalks;



- ◆ Nighttime lighting may be considered; and
 - ◆ Alternate route information should be communicated to pedestrians with visual disabilities by providing such things as audible devices, accessible pedestrian signals, or barriers and channelizing devices that are detectable.
- Did you consider:
- Special consideration for seniors and pedestrians with disabilities (lower walking speeds at signalized intersections, refuge island at wide intersections, flared curbs, oversized signs and signals, night lighting)?
 - Adequate pedestrian protection – physical separation from the workspace and vehicular traffic, overhead protection, etc.?
 - Requirements of the American with Disabilities Act (ADA) of 1990?
 - Location/access to business and residences?
 - Adequate and safe detour or diversion due to sidewalk closure or blockage?
 - Impact on existing pedestrian flow?
 - Impact on pedestrian generators (schools, senior centers and transit stops)?
 - Pedestrian information needs—advance, transition, work area and exit information?

Worker Safety at Intersections

Worker safety in work zones, especially at intersections, is an overarching consideration for highway agencies and utility companies. The combination of heavier traffic and a greater reliance on night work results in increased risks for highway workers. As a rule of thumb, flaggers or highway workers should not control intersections controlled by traf-

fic signals or STOP signs. Police officers generally receive training for this job. Other methods that can be used to minimize and control risks for workers are as follows:

- ❑ **High-visibility apparel**
All workers exposed to traffic should wear high-visibility safety apparel labeled as ANSI 107-1999 and be classified as either Class 1, 2, or 3 for risk exposure;
- ❑ **Worker Training**
All workers should be trained on how to work next to motor vehicle traffic in a way that minimizes their vulnerability;
- ❑ **Positive Separation**
Temporary traffic barriers should be placed along the work space on various factors such as distance between workers and traffic, traffic speed and volume, time of day and duration and type of operation;
- ❑ **Worker Safety Planning**
Planning, implementation and oversight of worker safety should be the responsibility of a competent safety specialist, and should adequately address the requirements of OSHA and the MUTCD;
- ❑ **Activity Area Planning**
Planning the internal work activity area to minimize backing-up maneuvers of construction vehicles should be considered to minimize exposure to risk; and
- ❑ **Speed Control**
Compliance with posted speed limits, mainly through regulatory speed zoning, funneling, lane reduction, or the use of uniformed law enforcement officers or flaggers, should be considered.

Improving Temporary Traffic Control at Intersections

When the normal function of the intersection is suspended due to roadwork, temporary traffic control planning provides for the continuity of movement of motor vehicle; bicycles; pedestrian traffic (including accessible passage); transit operations; and access (and accessibility) to utilities. Nighttime roadwork also continues to increase and the safety issues relating to traffic control are a major concern.

The following strategies can improve traffic safety and mobility in work zones:

- ❑ **Enhanced Traffic Control Devices**
Where possible use drums, vertical panels, or Type II barricades in tapers instead of cones. These devices provide more target area than cones;
- ❑ **Visibility of Work Vehicles**
High visibility of work vehicles at intersections, especially at night may reduce the risk of crashes;
- ❑ **Controlling Speed and Increasing Driver Awareness**
Although designing work zones to maintain normal speeds is desirable, restrictions may be necessitated by such things as lane width reductions, severe alignment changes, or workers exposed to high-speed traffic;
- ❑ **Providing Good, Glare-Free Illumination**
For night work at intersections properly aimed and adjusted work lights can provide good illumination without causing glare problems; and
- ❑ **Regularly check the work site to ensure that the placement and operation of traffic control devices continue to conform to applicable plans.**

Resources

The FHWA developed the *Best Practices Guidebook for Work Zone Safety* to give state and local transportation agencies, construction contractors, transportation planners, trainers and others with interest in work zone operations, access to contacts and information about current best practices for achieving work zone mobility and safety. More information on this guidebook can be obtained on the following Web site: <http://ops.fhwa.dot.gov/wz/wzguidbk/>.



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